AWS Solutions Architect—Associate Level

Lesson 9: Application Services

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What You'll Learn

AWS Key application services

Amazon SQS workflows

SWF task coordination

SNS notification

Uses of Elastic Transcoder

Best practices for application servers
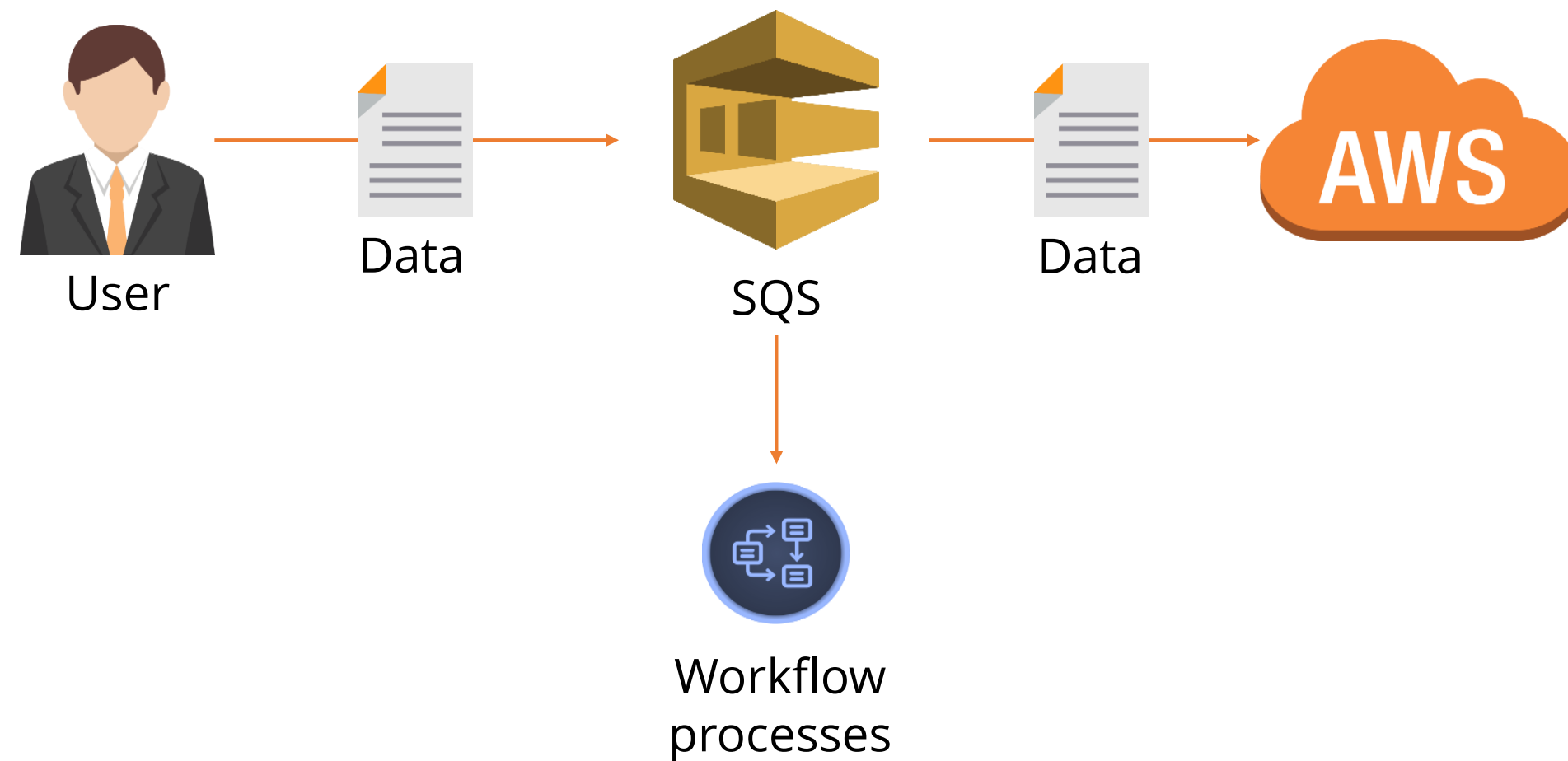
Application service costs

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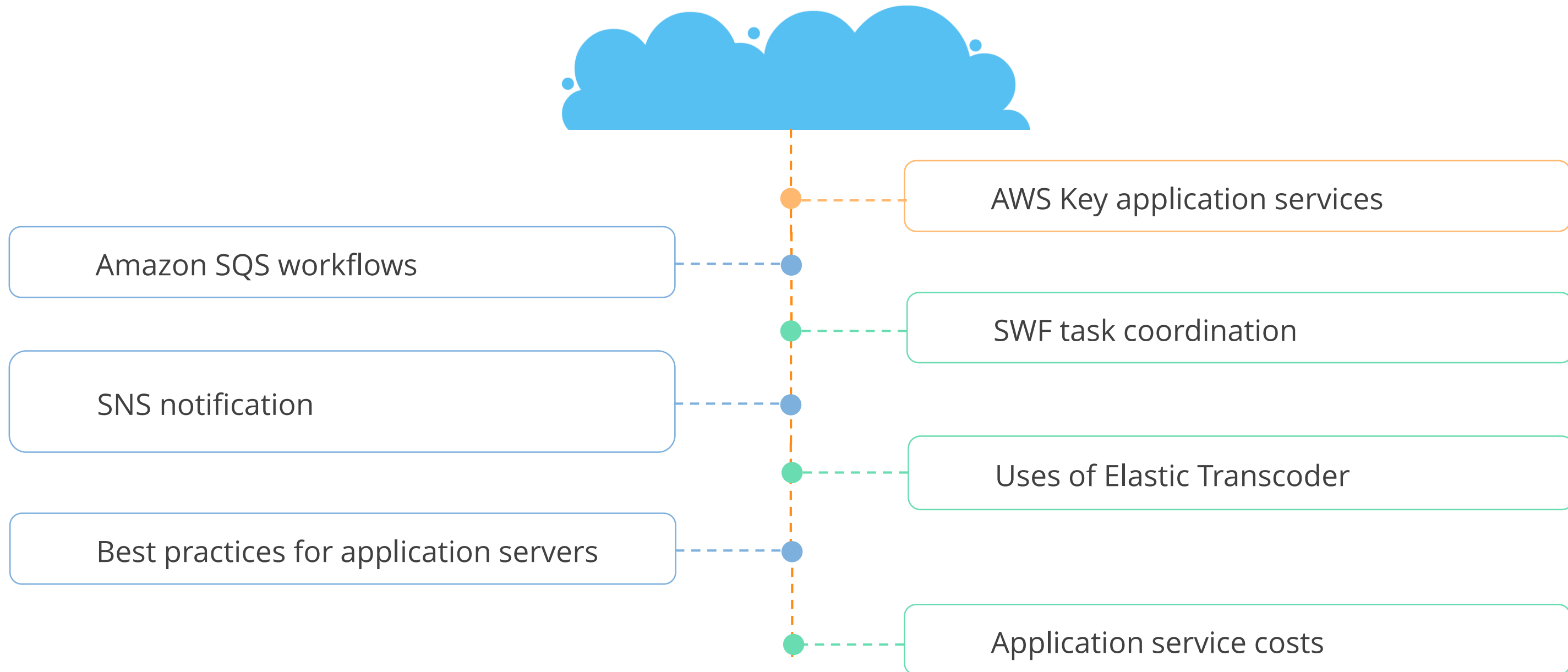
Amazon Simple Queue Service (SQS)

Details about Amazon Simple Queue Service (SQS)

Amazon Simple Queue Service

According to Amazon, "Amazon Simple Queue Service (SQS) is a fast, reliable, scalable, fully managed message queuing service."

User   Data   SQS   Data   AWS
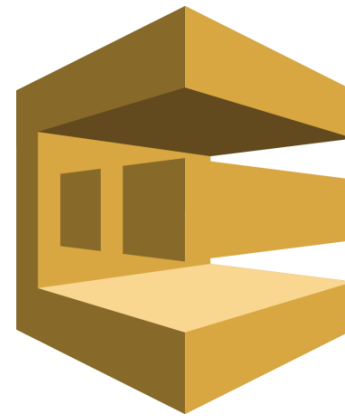
Workflow processes

ℹ️ Amazon SQS was one of the first services released by AWS.

Amazon SQS Workflow

SQS allows you to decouple the components of a cloud application, which is an important concept of the AWS Well-Architected Framework.
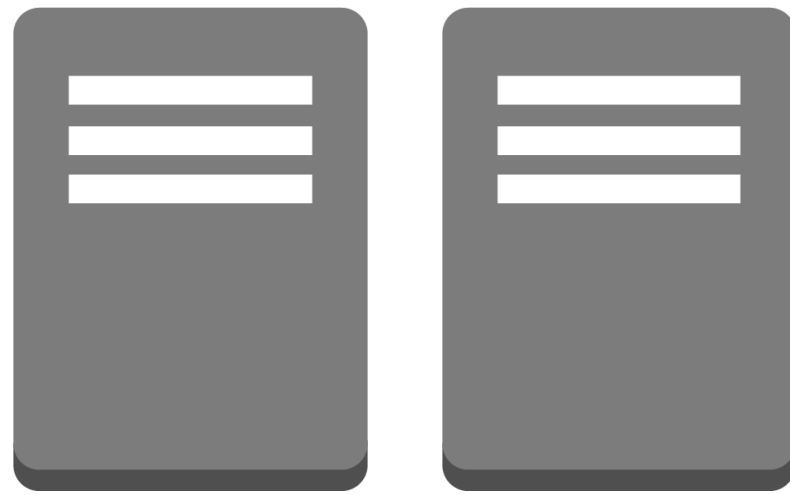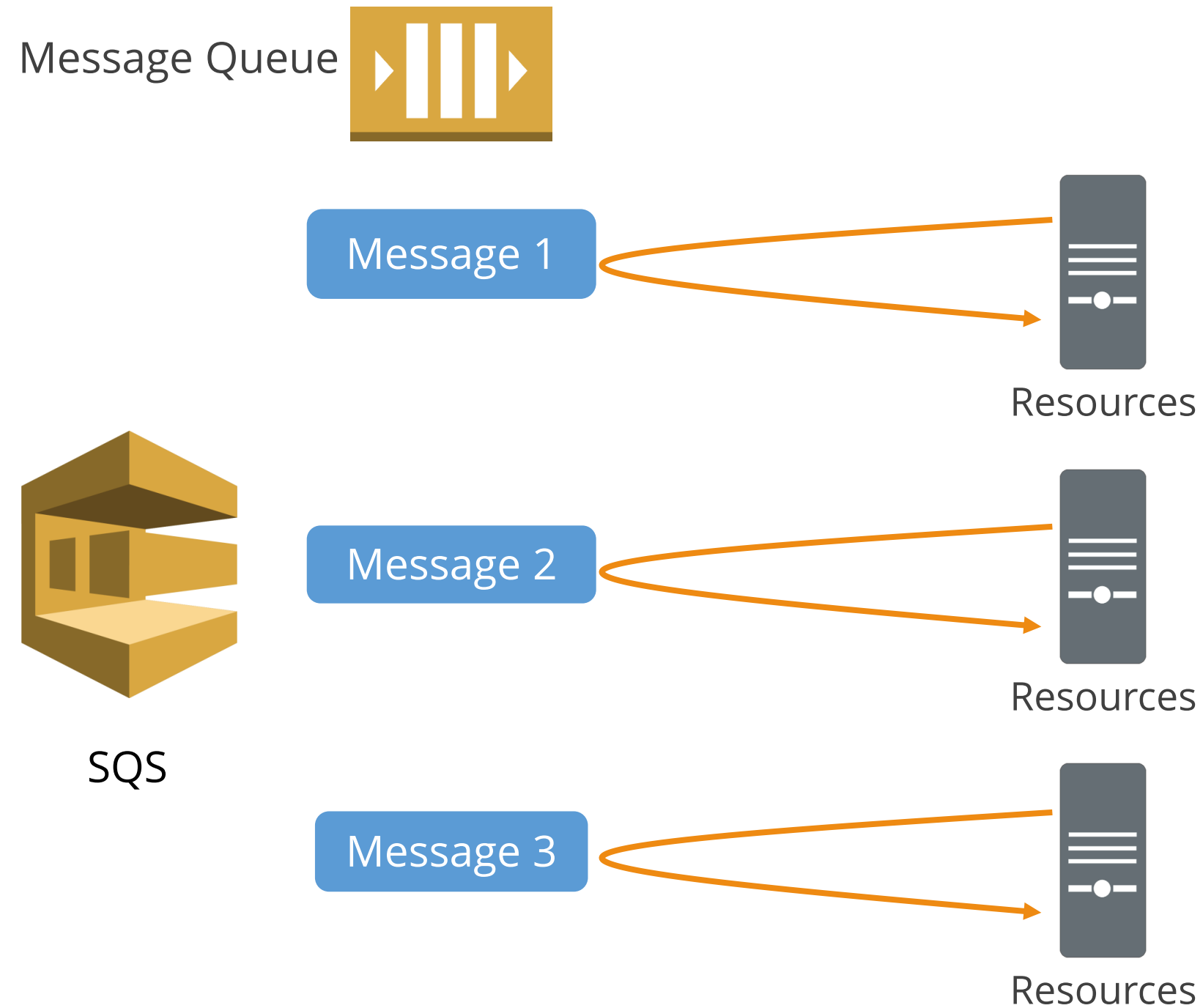

The component producing and saving the data

SQS

The component receiving and processing the data

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Amazon SQS Availability

● SQS is always available and ensures delivery of each message at least once.

● SQS does not guarantee first in, first out.

● If messages need to be delivered in the order they arrived, you can place sequencing information in each message.

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Pull Model

Resources poll (or pull) messages from SQS. It does not push messages.
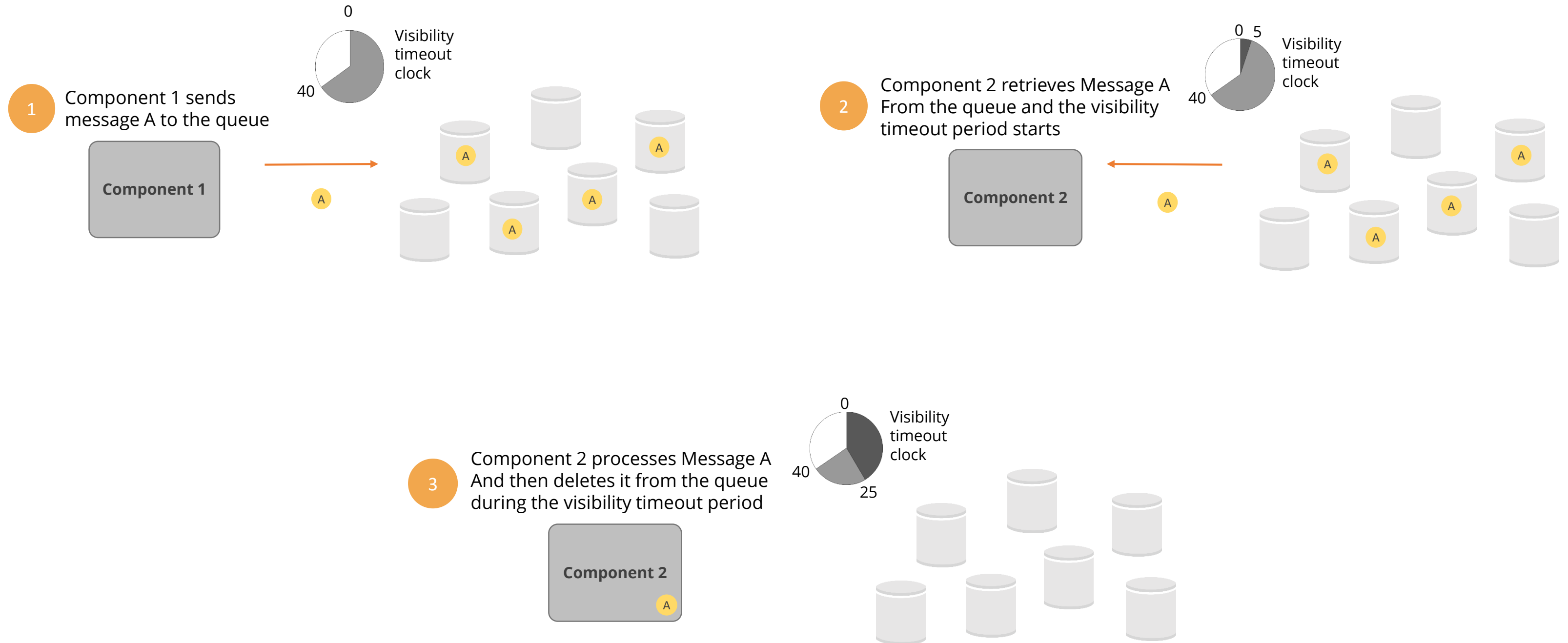
Message Queue

Message 1 → Resources

SQS

Message 2 → Resources

Message 3 → Resources

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SQS Messages

Messages can contain up to 256KB of text and are billed in 64KB chunks.

SQS

SQS
Messages

256 KB of
Text
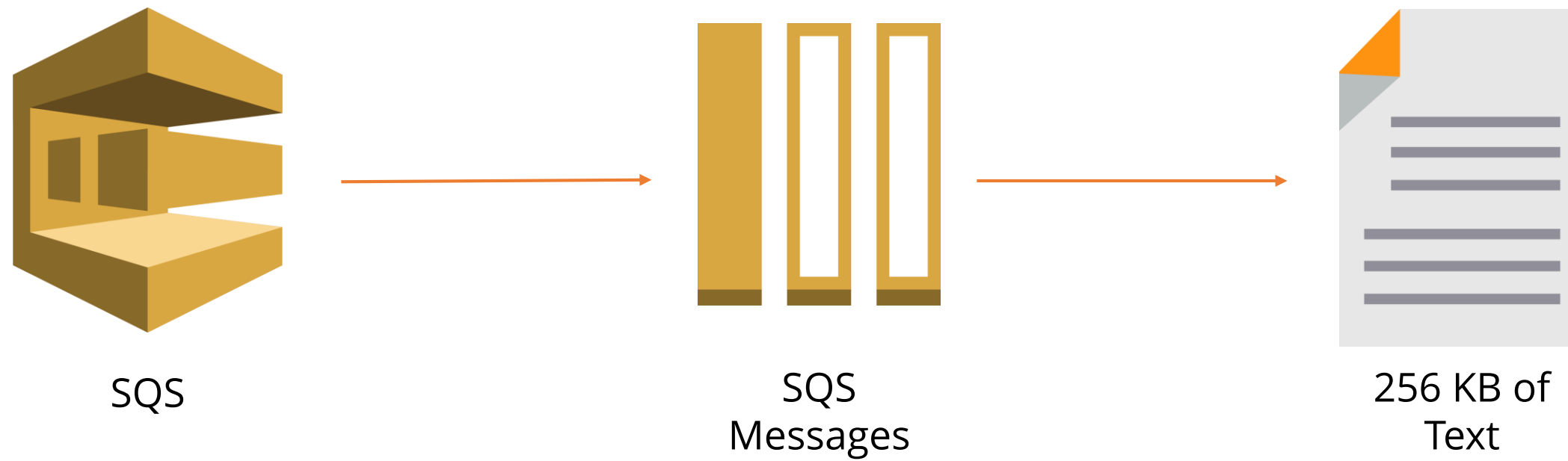
SQS Message Lifecycle

Guaranteed delivery is ensured using visibility timeout clock.

1 Component 1 sends message A to the queue

0
Visibility timeout clock
40

Component 1

A

2 Component 2 retrieves Message A From the queue and the visibility timeout period starts

0 5
Visibility timeout clock
40

Component 2

A

3 Component 2 processes Message A And then deletes it from the queue during the visibility timeout period

0
Visibility timeout clock
40
25

Component 2

A

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SQS Auto Scaling

Amazon SQS provides Auto Scaling. If the queue becomes too large, you can configure SQS to launch more instances.

Message 1

Message 2

SQS

Message 3

Resources

Message 4

Resources
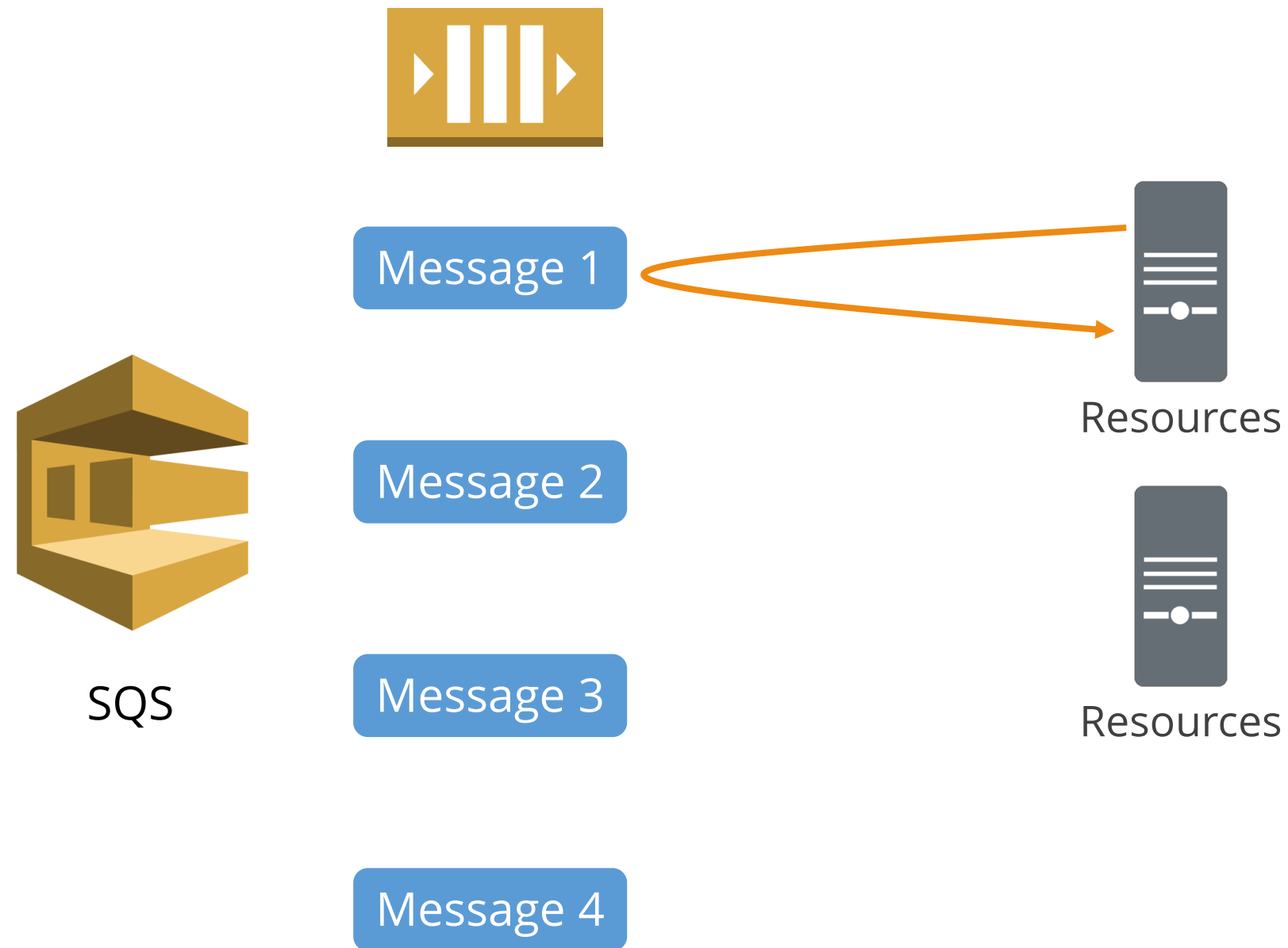
SQS Key Points

The key features of SQS:

01	Does not support First In, First Out

02	Visibility timeout clock is up to 14 days

03	Messages are guaranteed to be delivered at least once

04	Messages are in the size of 256KB, which is billed in 64KB chunks

05	Decouples your infrastructure

Knowledge Check

Amazon SQS ensures that each message is _____.

a.   Pushed to resources at least once

b.   Available to resources on a First In, First Out basis

c.   Guaranteed to be delivered at least once

d.   Only delivered once to resources

Amazon SQS ensures that each message is _____.

a. Pushed to resources at least once

b. Available to resources on a First In, First Out basis

c. Guaranteed to be delivered at least once

d. Only delivered once to resources

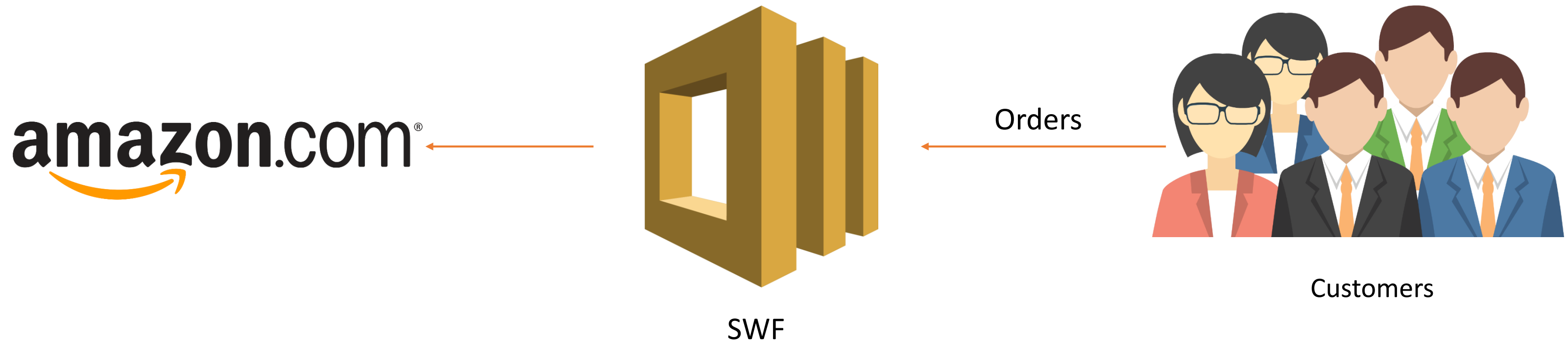The correct answer is   **c**

Amazon SQS guarantees that all messages are delivered at least once using a poll based model.

Amazon Simple Workflow Service (SWF)

Details about Amazon SWF
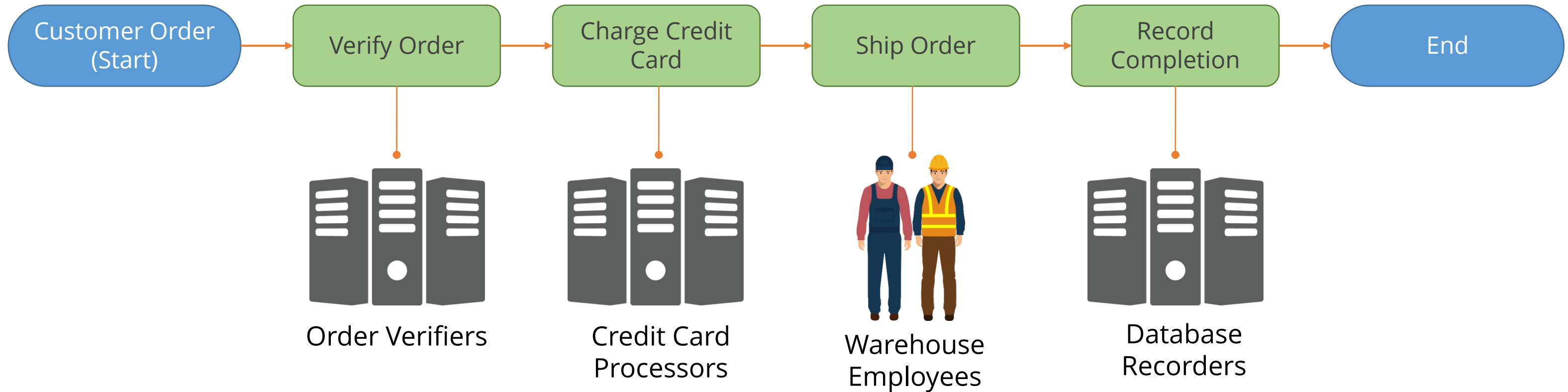
Amazon Simple Workflow Service

According to Amazon, "Amazon SWF helps developers build, run, and scale background jobs that have parallel or sequential steps. You can think of Amazon SWF as a fully-managed state tracker and task coordinator in the Cloud."

amazon.com®

Orders

Customers

SWF

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Amazon SWF Example

Amazon.com uses SWF to manage its online orders.

| Customer Order (Start) | → | Verify Order | → | Charge Credit Card | → | Ship Order | → | Record Completion | → | End |

Order Verifiers

Credit Card Processors

Warehouse Employees

Database Recorders

SWF Actors

1 ┄ Workflow starters: applications that initiate/start a workflow

2 ┄ Deciders: control flow of activity or tasks in a workflow

3 ┄ Workers: carry out the activity task

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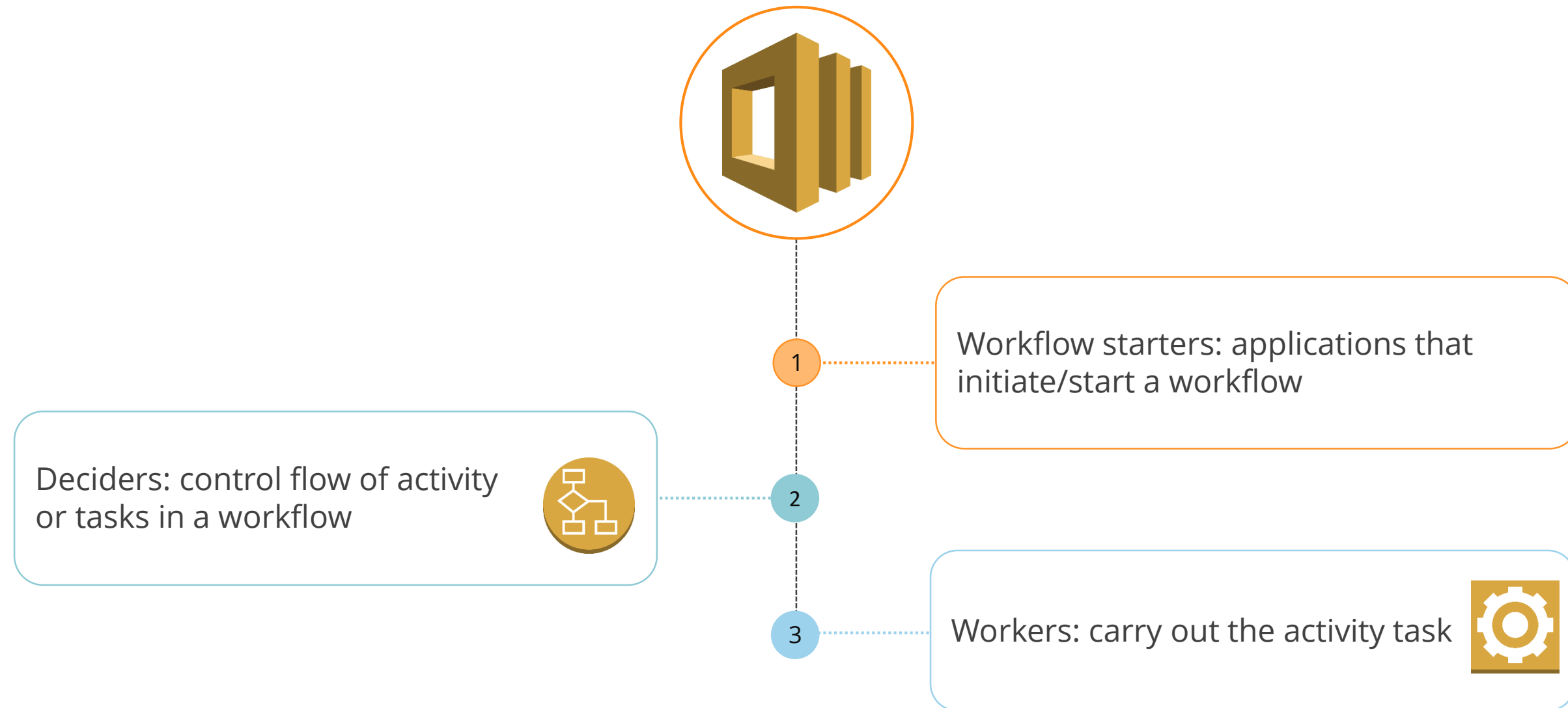
SWF versus SQS

A comparison between SWF and SQS:

	SWF	SQS
Message Retention Period	Up to 1 year	Up to 14 days
API	Task oriented	Message oriented
Delivery	Assigned once Never duplicated	Message can be delivered more than once
Tracking	Keeps track of all tasks and events	Need to create your own application-level tracking

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Knowledge Check

How long is an Amazon SWF message valid?

a. Up to 12 months

b. Up to 14 days

c. 12 months exactly

d. 4 days

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b. Up to 14 days

c. 12 months exactly

d. 4 days
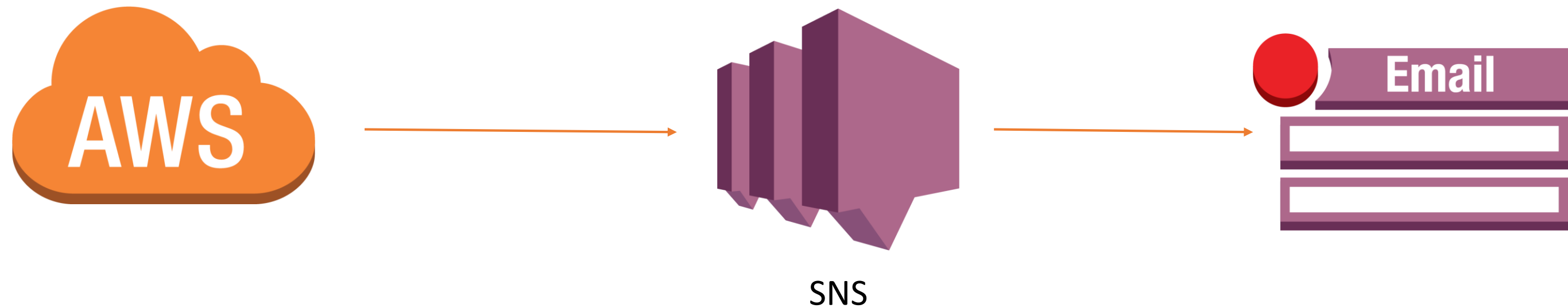
The correct answer is **a. Up to 12 months**

Amazon SWF messages are valid for up to 12 months.

Amazon Simple Notification Service (SNS)

Details about Amazon SNS

Amazon SNS

According to Amazon, "Amazon SNS is a fully managed publication-subscription based messaging service used to send push notifications, email, and SMS messages."
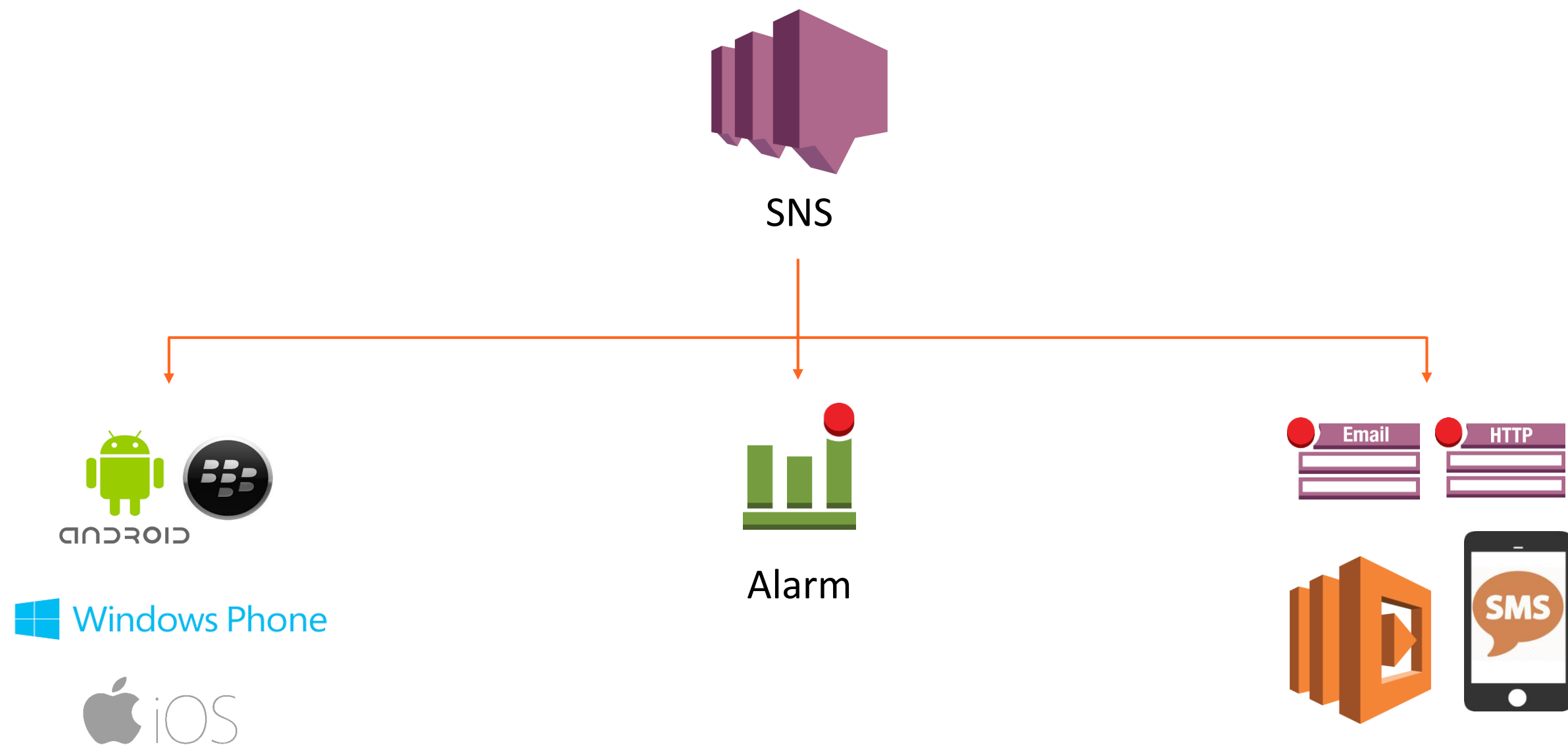

SNS

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Push Model

Push notifications can be sent to operating systems running on mobile devices for example, iOS, Android, Firefox, Windows, and so on.
Push notifications can be sent to email, SMS, lambda functions, or to any HTTP endpoint.

SNS

Alarm

SNS Topics

An SNS topic is a communication channel that allows you to send messages and subscribe to notifications.

Publisher

Access Point

SNS Topic

Lambda

SQS

HTTP/S

Email

SMS

Subscriber

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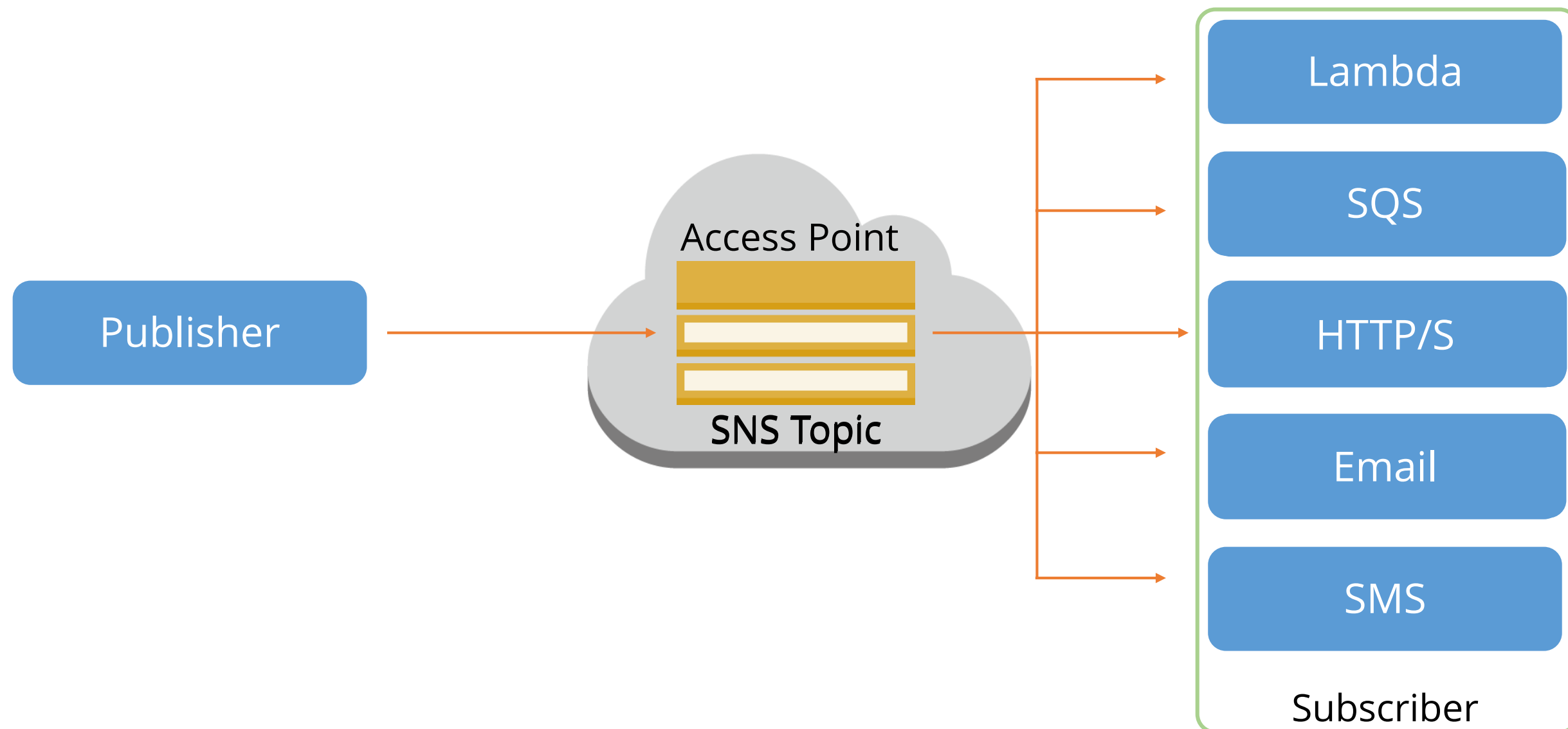
SNS Features

The SNS features are:

- Instantaneous push based delivery

- Multiple transfer protocol

- A pay-as-you-go model

- A simple web-based interface

- Messages stored redundantly across multiple availability zones

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SNS versus SQS

A comparison between SNS and SQS:

SNS	SQS
PUSH based	POLL based (PULL)
Allows applications to send time-critical messages to multiple subscribers	A service used by distributed applications to exchange messages

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Demo 1: Amazon SNS

Demonstrate how to configure Amazon SNS to send notifications

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Knowledge Check

KNOWLEDGE CHECK

To which of the following Amazon services is SNS unable to send messages to?

a. SMS

b. Amazon S3

c. Lambda

d. HTTP Endpoints

To which of the following Amazon services is SNS unable to send messages to?

a. SMS

b. Amazon S3

c. Lambda

d. HTTP Endpoints

The correct answer is   **b**

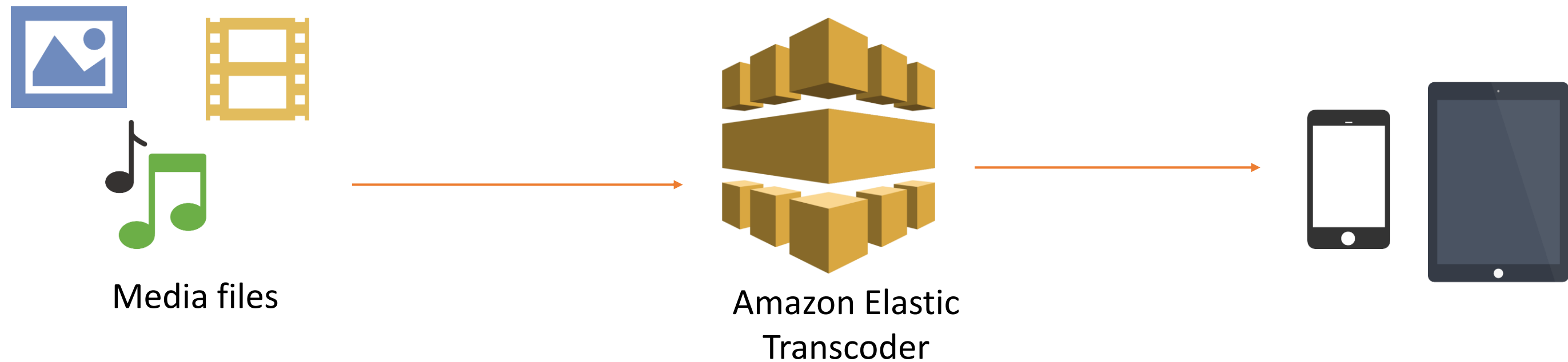**Amazon SNS can send messages from Amazon S3, but not directly to Amazon S3.**

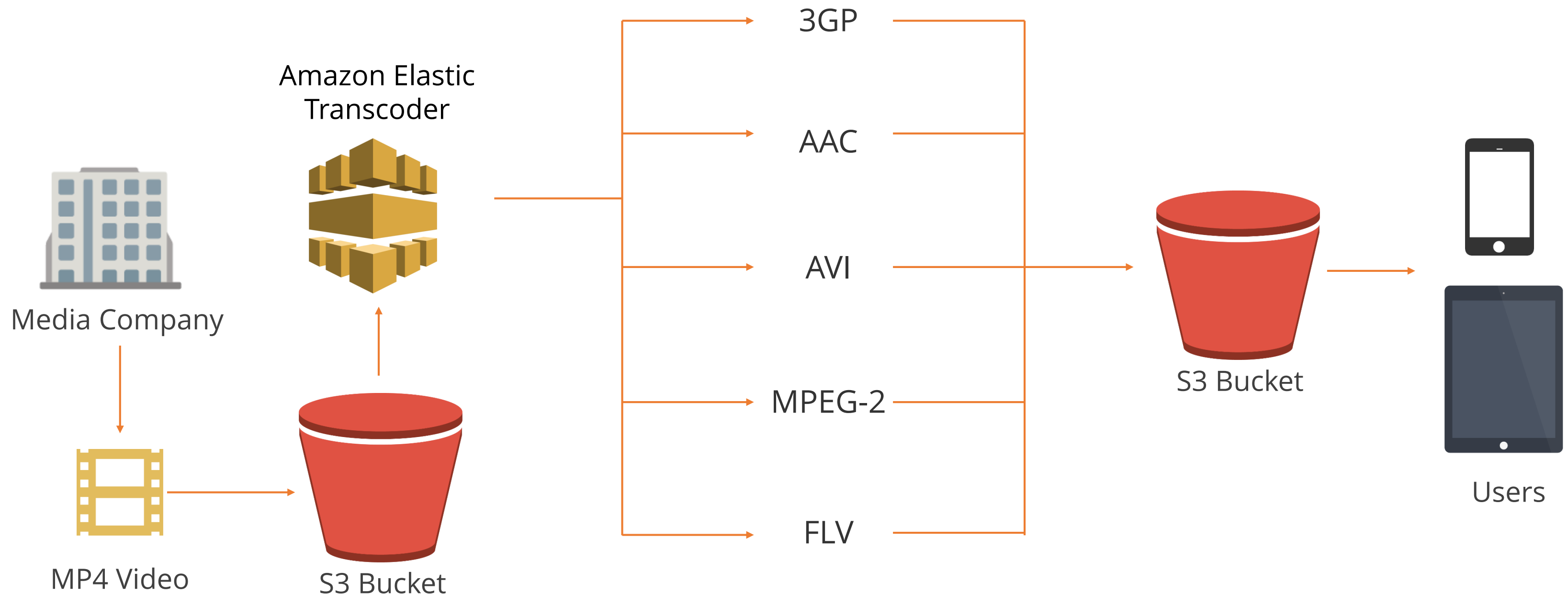# Amazon Elastic Transcoder

Overview of Amazon Elastic Transcoder

Amazon Elastic Transcoder

Amazon Elastic Transcoder is a media transcoding service in the Cloud.

Media files

Amazon Elastic Transcoder

Elastic Transcoder Example

A media company creates a new MP4 video for distribution online. You can upload the video to an S3 bucket and configure Elastic Transcoder to pick it up and convert it into a range of other specified formats. The new formats are saved back into an Amazon S3 bucket.

Media Company

MP4 Video

Amazon Elastic Transcoder

S3 Bucket

3GP

AAC

AVI

MPEG-2

FLV

S3 Bucket

Users

35

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Knowledge Check

What is Amazon Elastic Transcoder used for?

a. Streaming real time media

b. Storing media files cost effectively

c. Converting media files to different formats

d. Providing low latency media content to end users

What is Amazon Elastic Transcoder used for?

a. Streaming real time media

b. Storing media files cost effectively

c. Converting media files to different formats

d. Providing low latency media content to end users

The correct answer is **c**

Elastic Transcoder is used to convert media files from original format into other formats that will play on smartphones, tablets, and so on.

Application Services Best Practices

Overview of AWS recommended Application Services best practices

SQS Best Practices

The AWS recommended Application Services best practices are:

SQS
SWF
SNS

- Use SQS to help you architect stateless applications and to use asynchronous integration.

- Use SQS to create a message queue so that resources can process a task and send the information back to SQS.

- Asynchronous integration involves the use of an intermediate storage layer like SQS.

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SWF Best Practices

The AWS recommended Application Services best practices are:

SQS	• Use SWF when you need to coordinate and track tasks that have parallel or sequential steps and involve more than just AWS resources.
SWF	• SWF is best used to coordinate tasks without a given framework.
SNS	

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SNS Best Practices

The AWS recommended Application Services best practices are:

SQS

SWF

SNS

- Use SNS to keep you informed about any events occurring with your AWS resources.
- Use SNS to push notifications to Lambda to create distributed processes that don't rely directly on each other.

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Application Services Costs

Overview of costs associated with Application Services

Application Services Costs

The applicable costs for the Application Services:

| Amazon SQS | • Charge per million SQS requests per month (the 1st million is free)
• Charge for data transfer out of AWS |

| Amazon SWF | • Charge per workflow execution
• Charge per 24 hour period that a workflow is open
• Charge per tasks, markers, timers, and signals that occur during an open workflow
• Charge for data transfer out of AWS |

| Amazon SNS | • Charge per million mobile push notifications
• Charge per 100 SMS
• Charge per 1,00,000 email
• Charge per 1 million HTTP endpoint notifications
• No charge to SQS or Lambda |

| Amazon Elastic Transcoder | • Charge per minute of media to be transcoded |

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Practice Assignment: Amazon SNS

Configure an SNS topic to send alerts

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Amazon SNS Notifications

Your company wants to be notified when users delete files from their Amazon S3 bucket.

You will need to perform the following steps:

1. Configure an SNS topic

2. Add your email address as a subscriber to the topic

3. Configure the topic policy to allow permissions from other resources

4. Configure an S3 event for the delete

5. Verify that your event notification worked

You can use Demonstration 1 from this lesson as a reference for this Practice Assignment.

Key Takeaways

Key Takeaways

- Amazon Simple Queue Service (SQS) is a fast, reliable, scalable, fully managed message queuing service.

- Amazon SWF is a fully-managed task coordinator and tracker that allows you to build, run, and scale background jobs that have parallel or sequential steps.

- SWF and SQS differ based on the criteria of message retention period, API, delivery, and tracking.

- Amazon SNS is a fully managed publication-subscription based messaging service that can be used to send push notifications, emails, and SMS messages.

- SNS is a PUSH based service whereas SQS is POLL based (PULL).

- Amazon Elastic Transcoder is media transcoding service in the Cloud.

This concludes "Application Services."

The next lesson is "Security Practices for Optimum Cloud Deployment."

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