Ch-5
SNS, SQS, SWF

This chapter will cover following topics...

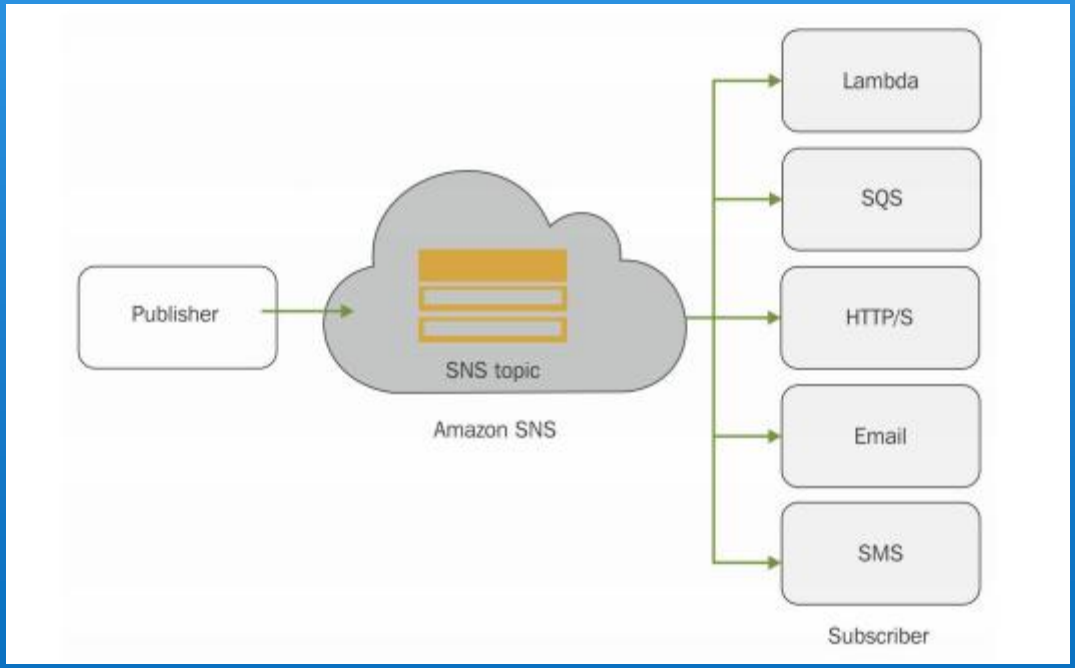
- SNS – Simple Notification Service
- SQS – Simple Queuing Service
- SWF – Simple Workflow Service

SNS – Simple Notification Service

Introduction:

Amazon SNS is a managed notification service

It works on a push mechanism, the publisher raises a request to send a message to the subscribers



SNS – Simple Notification Service(Conti…)

Some of the use-cases of notifications:

Installed applications on smart phone, often send notification for offers and other notifications

SMS notification on any valid mobile number

When EC2 machine over load or under load of the performance, it automatically send notification to the admin for the same

SNS – Simple Notification Service(Conti…)

Push v/s Pull mechanism:

AWS Simple Notification Service (SNS) works on a **push** technology.

It is also called **server push**. It means, the message or the transaction is initiated by the publisher and SNS delivers the same to the subscribers

It is opposite to **pull** mechanism, which is also called **client pull**. In which, the client raises the request to fetch or pull data from the server

SQS works on pull mechanism while SNS works on push mechanism

SNS – Simple Notification Service(Conti…)

Way of working:

First, you need to create an Amazon SNS topic

An SNS topic acts as an access point in between the publisher and subscriber applications

The publisher communicates asynchronously with the subscribers using SNS

Subscribers can be an entity such as a Lambda function, SQS, HTTP or HTTPS endpoint, email, or a mobile device that subscribes to SNS topic for receiving notifications

To receive notifications, subscribers must specify the protocol (that is, HTTP, HTTPS, Email, Email-JSON, Amazon SQS, Application, AWS Lambda, SMS)

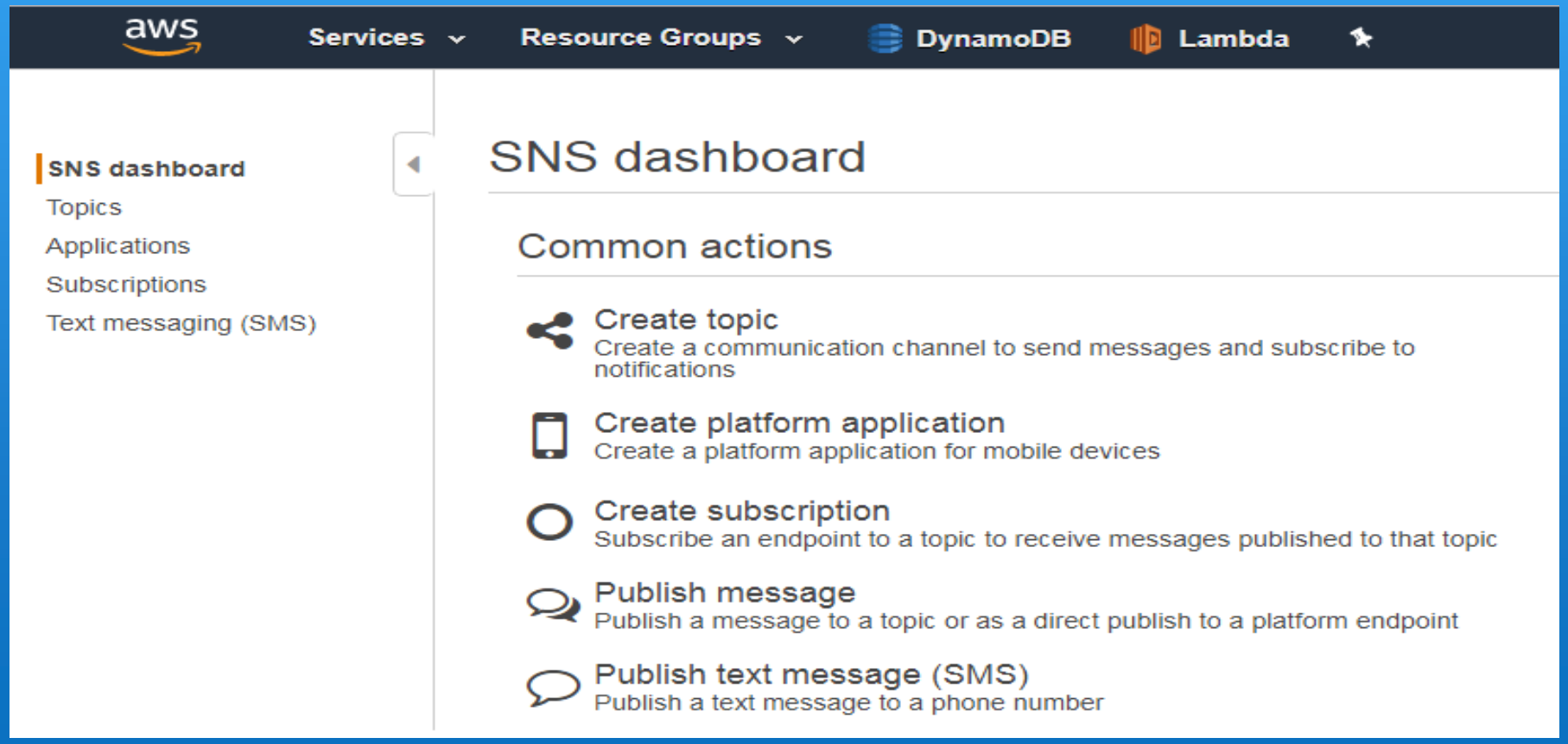
When a publisher has new information to notify to the subscribers, it publishes a message to the topic

Finally, SNS delivers the message/notification to all subscribers.

SNS – Simple Notification Service(Conti…)

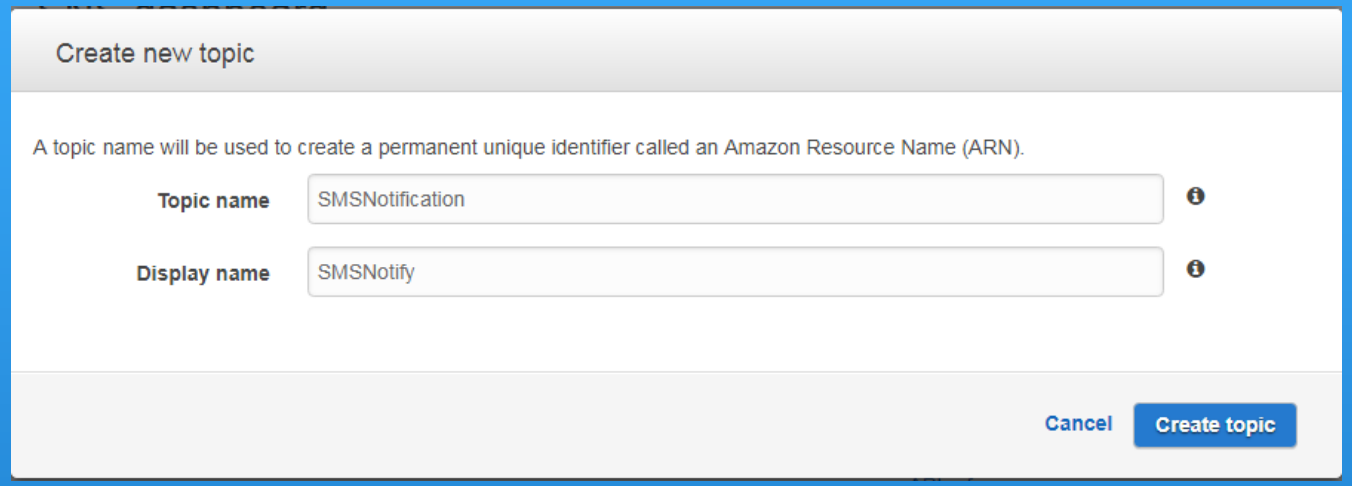
Creating SNS topic:

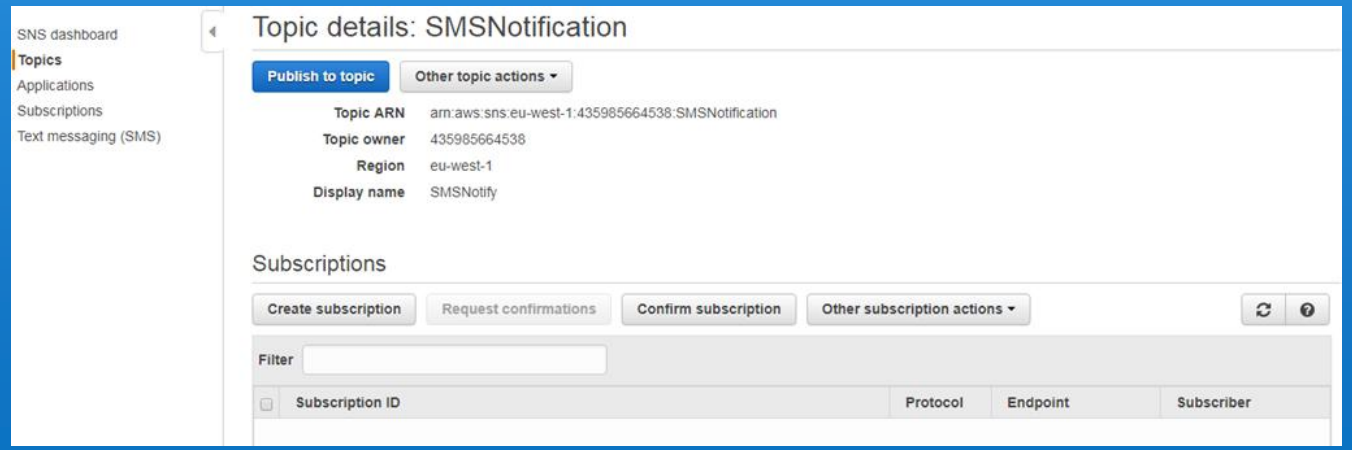
First, it is essential you create an SNS topic, then it is possible for a publisher to publish a message and for subscribers to subscribe to get a notification.



SNS – Simple Notification Service(Conti…)

Creating SNS topic:





SNS – Simple Notification Service(Conti…)

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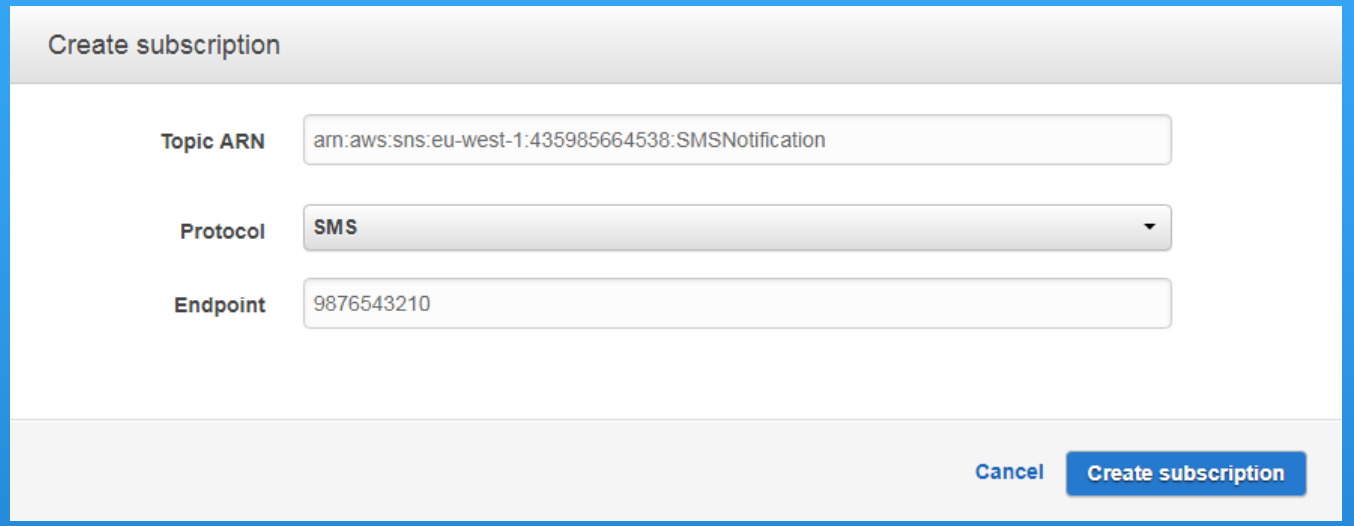

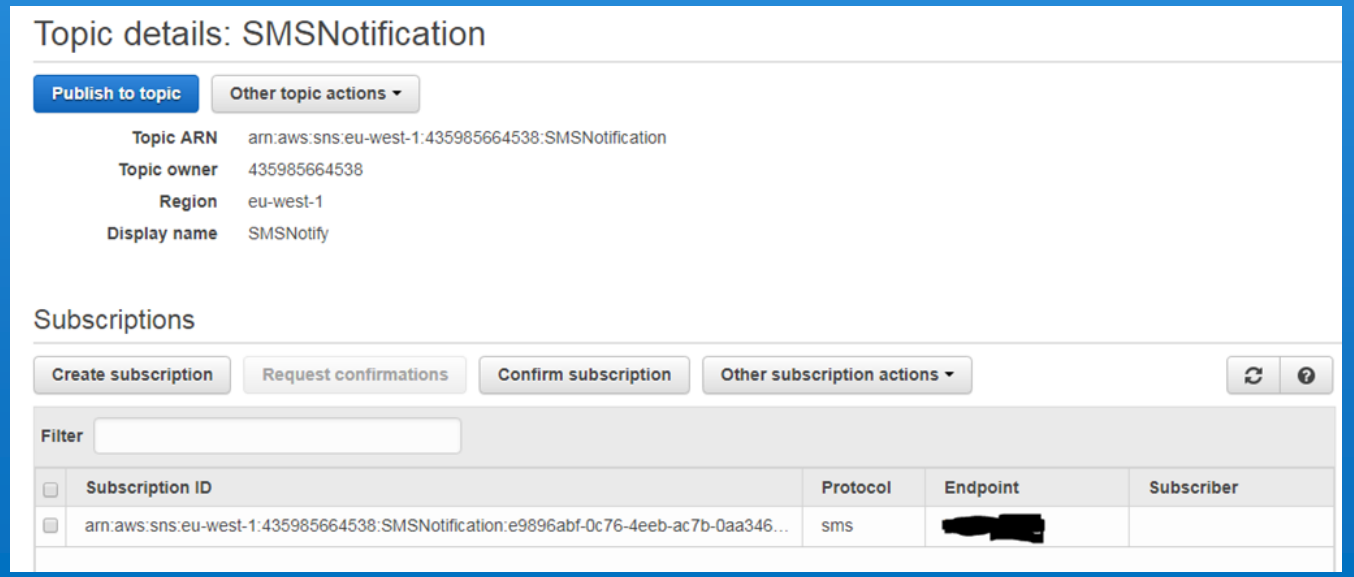

SNS – Simple Notification Service(Conti…)

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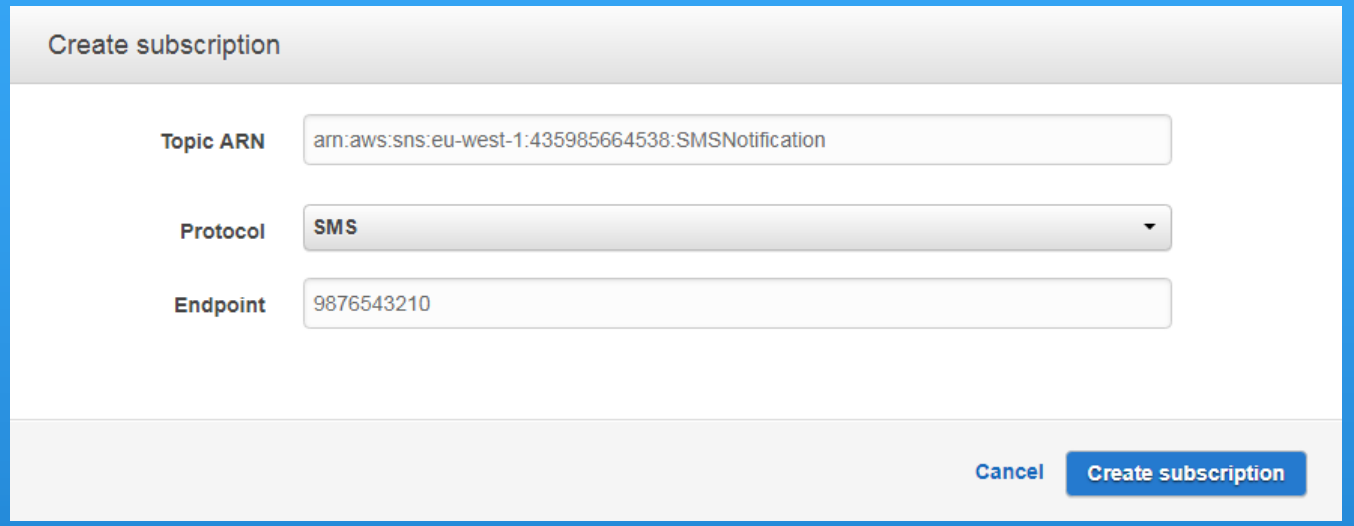
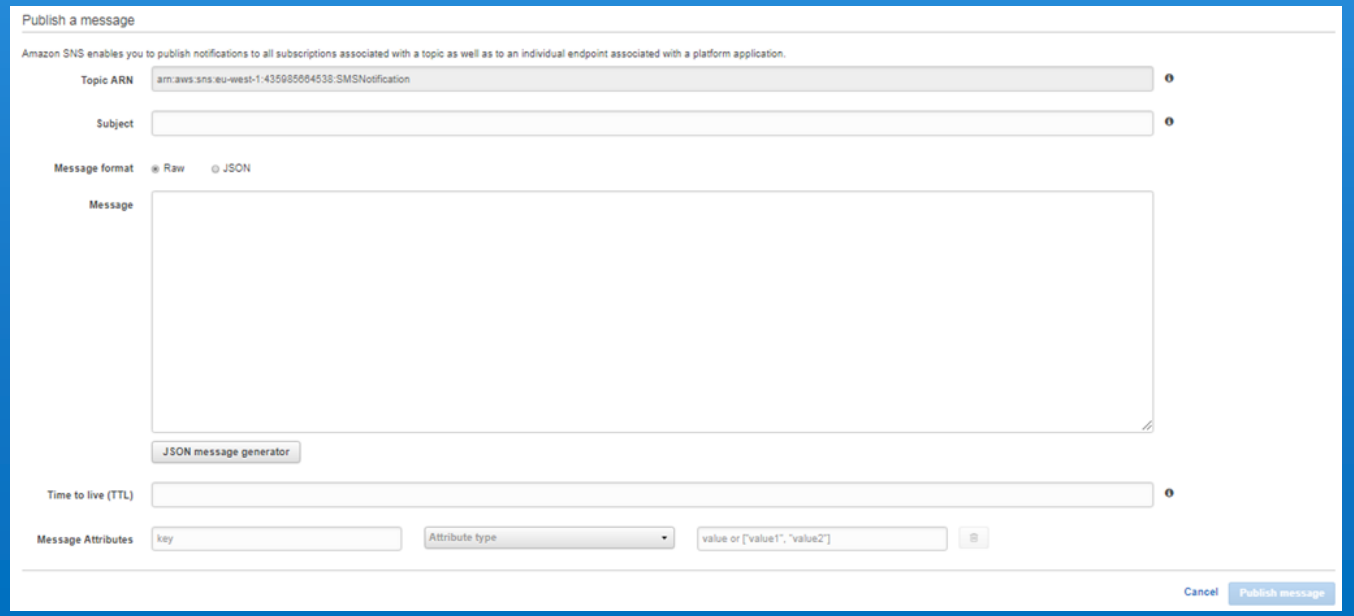




SQS – Simple Queuing Service(Conti…)

Introduction:

SQS is a highly reliable, scalable, and distributed message queuing service provided by Amazon

It's a hosted solution provided by Amazon so that you do not need to manage the service infrastructure

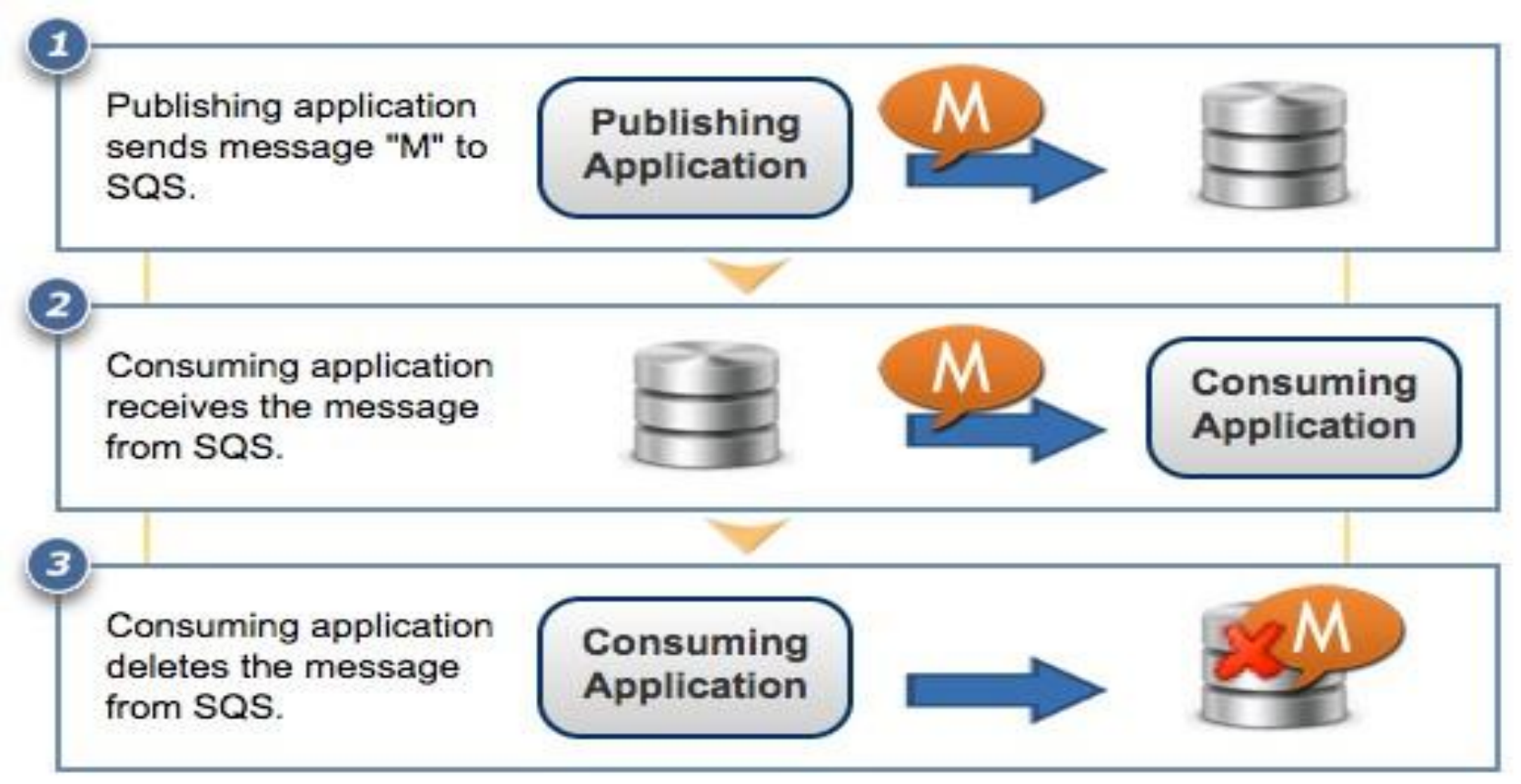
SQS stores the messages in transit as they travel between various applications and micro services

Scenarios for SQS:

News website with image upload facility – Optimization

SQS – Simple Queuing Service(Conti…)

Way of working:



SQS – Simple Queuing Service(Conti…)

Features of SQS:

Redundant infrastructure: ensures that a message is delivered at least once in a standard queue and it ensures that a message is delivered exactly once in a **First In First Out** (**FIFO**) queue.

Multiple producers and consumers: Multiple components of a distributed application can concurrently send and receive messages at the same time.

Queue-wise configurable settings: SQS provides options to configure each queue independently. You do not need to have the same configuration for all the queues.

Variable message size: SQS supports a maximum message size of 256 KB.

Queue access control: SQS allows you to control producers and consumers that can send and receive messages to or from the queue.

Delay queue: SQS enables you to set a delay time in a queue. Delay time ensures that a message inserted in the queue is postponed for the time configured as *delay time* in the queue.

SQS – Simple Queuing Service(Conti…)

Types of Queues:

1. **Standard queue**

It's available in all AWS regions.

It supports an almost unlimited number of **Transactions Per Second** (**TPS**) with each API action.

It generally sends the data in the same order as it receives it, however, in certain occasions the order may change.

Standard queue guarantees that a message will be delivered at least once, however, occasionally a message may be delivered more than once.

It is used when the throughput is more important than the order in which the data is processed.

SQS – Simple Queuing Service(Conti…)

Types of Queues:

2. FIFO queue

It's available only in the US East (N. Virginia), US East (Ohio), US West (Oregon), and EU (Ireland) regions.

It supports limited throughput. It can support up to 300 messages per second without any batching.

With a batch size of 10 messages, it can support up to 3,000 messages per second.
It ensures that the data is sent in FIFO order.

FIFO queue guarantees that a message will be delivered exactly once. The message remains in the queue until the consumer confirms that the message is processed.

It is used when the order in which the data is processed is more important than the throughput.

SQS – Simple Queuing Service(Conti…)

Dead Letter Queue (DLQ)

A DLQ is used by other queues for storing failed messages that are not successfully consumed by consumer processes.

SQS uses a redrive policy to indicate the source queue, and the scenario in which SQS transfers messages from the source queue to the DLQ.

If a queue fails to process a message a predefined number of times, that message is moved to the DLQ.

While creating a queue, you can enable a redrive policy and set the DLQ name as well as maximum receive count, after which if the message is still unprocessed, it can be moved to the DLQ.

SQS – Simple Queuing Service(Conti…)

Queue attributes:

Default visibility Timeout - The length of time that a message is received from a queue will be invisible to other receiving components.

Message Retention Period - The amount of time that SQS retains a message if it does not get deleted.

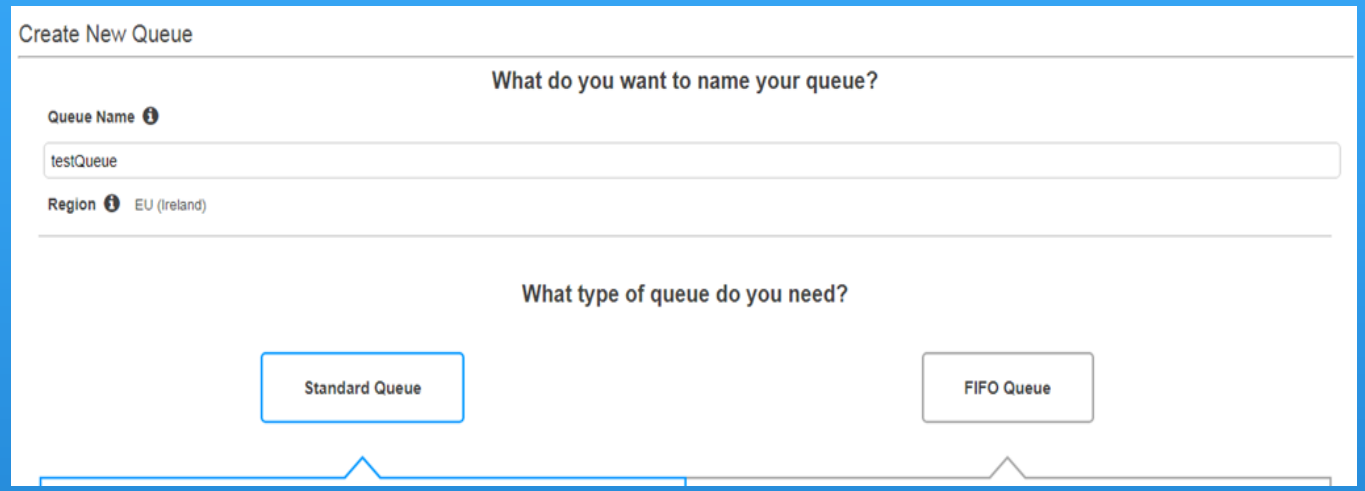
Maximum Message Size - Maximum message size accepted by SQS.

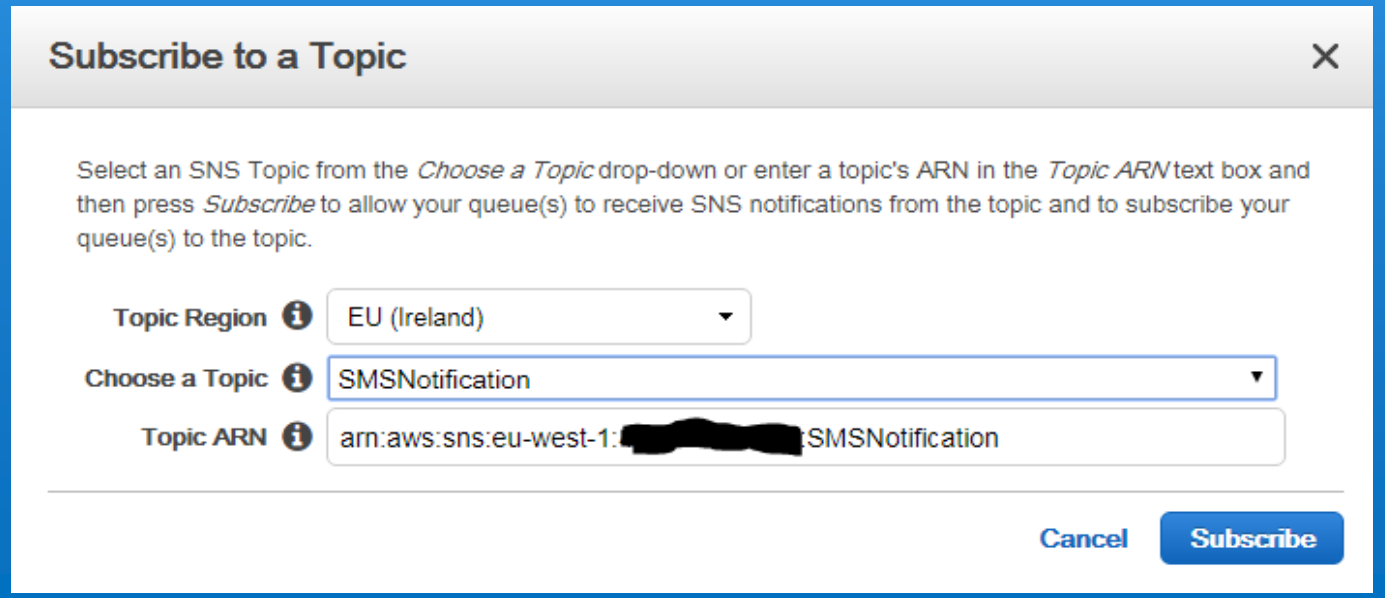
Delivery Delay - The amount of time to delay the first delivery of all messages added to the queue.

Receive Message Wait Time - The maximum amount of time that a long polling receive call waits for a message to become available before returning an empty response.

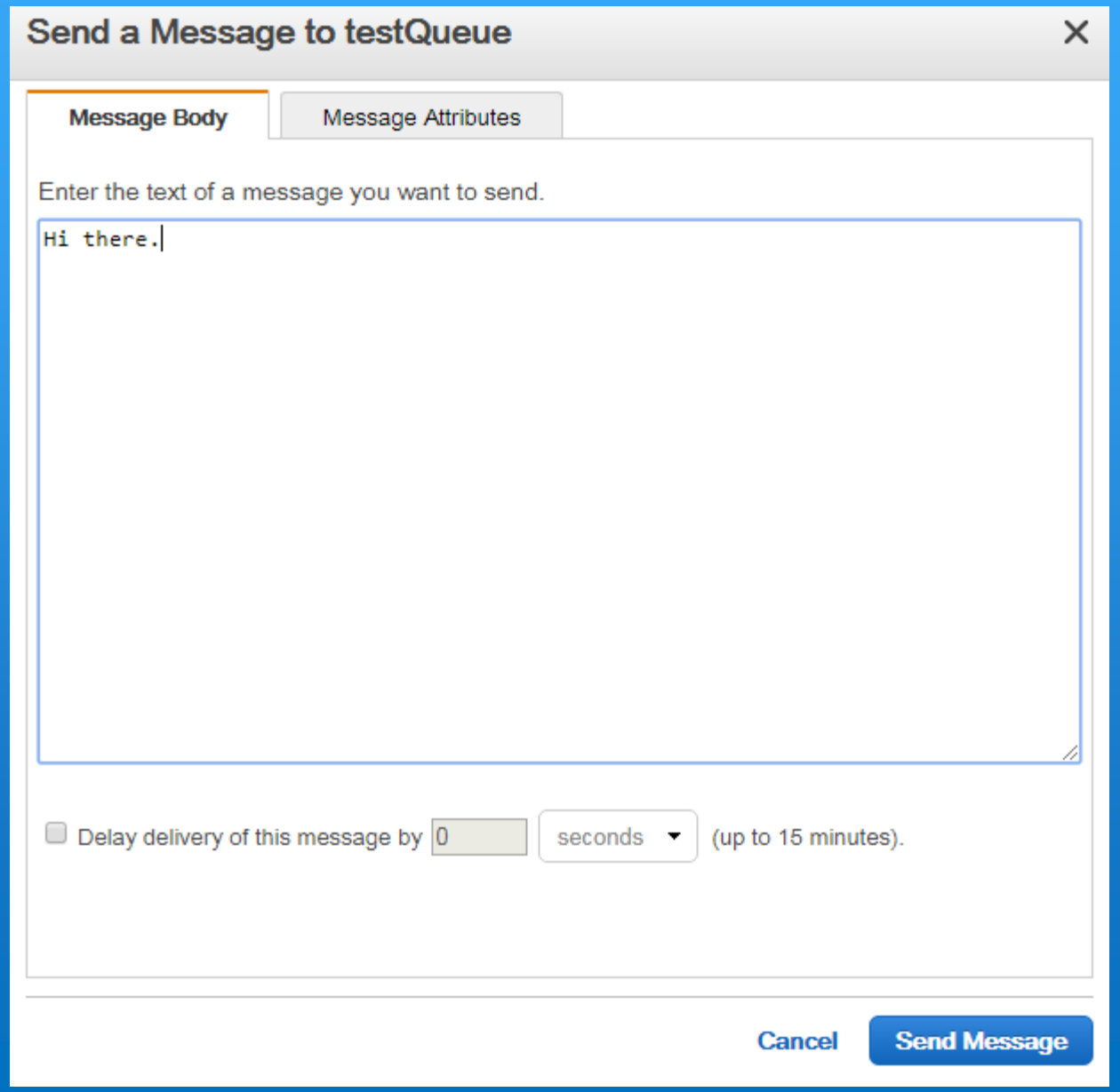
SQS – Simple Queuing Service(Conti…)

Creating a queue:

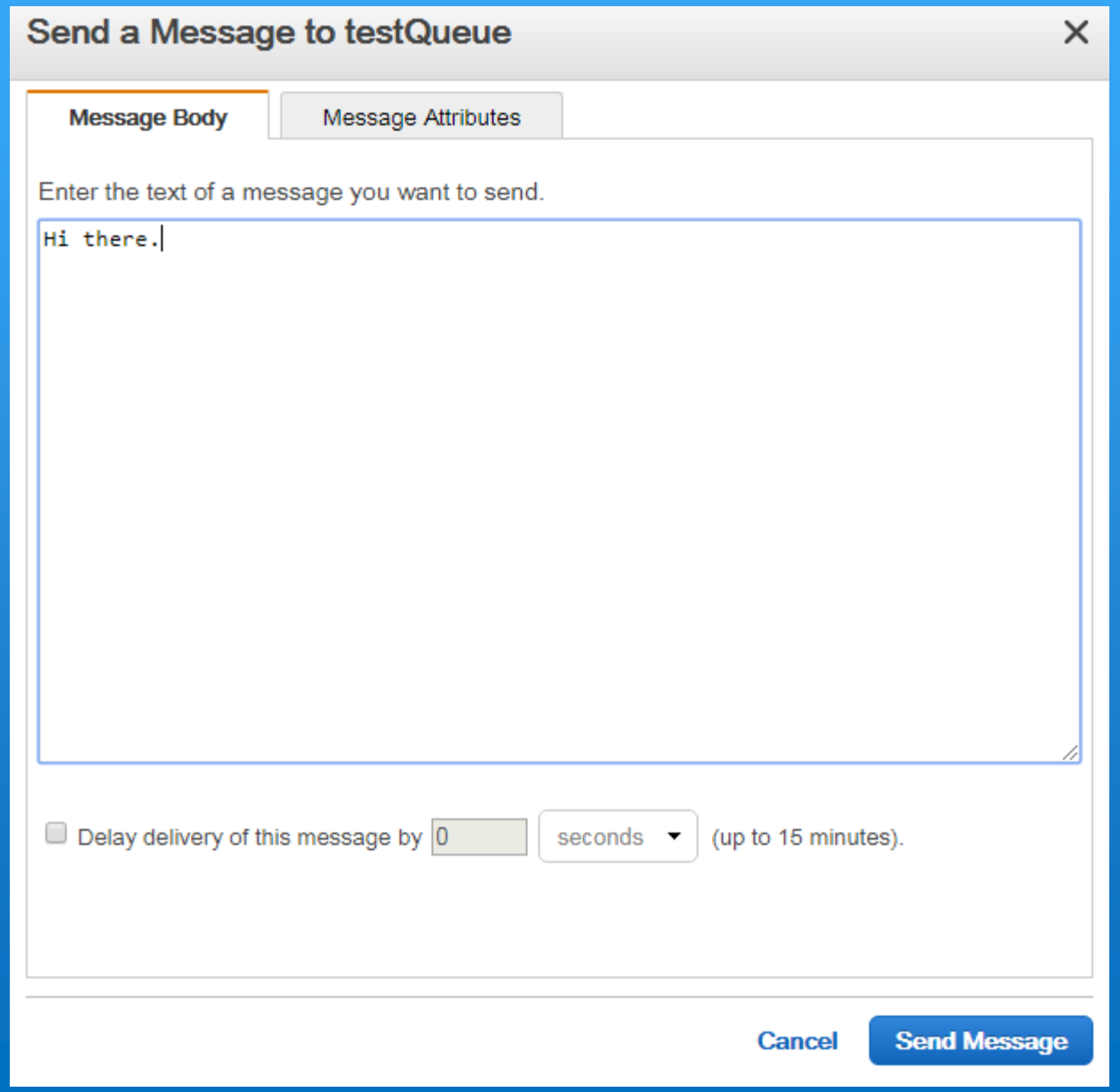




SQS – Simple Queuing Service(Conti…)



SQS – Simple Queuing Service(Conti…)



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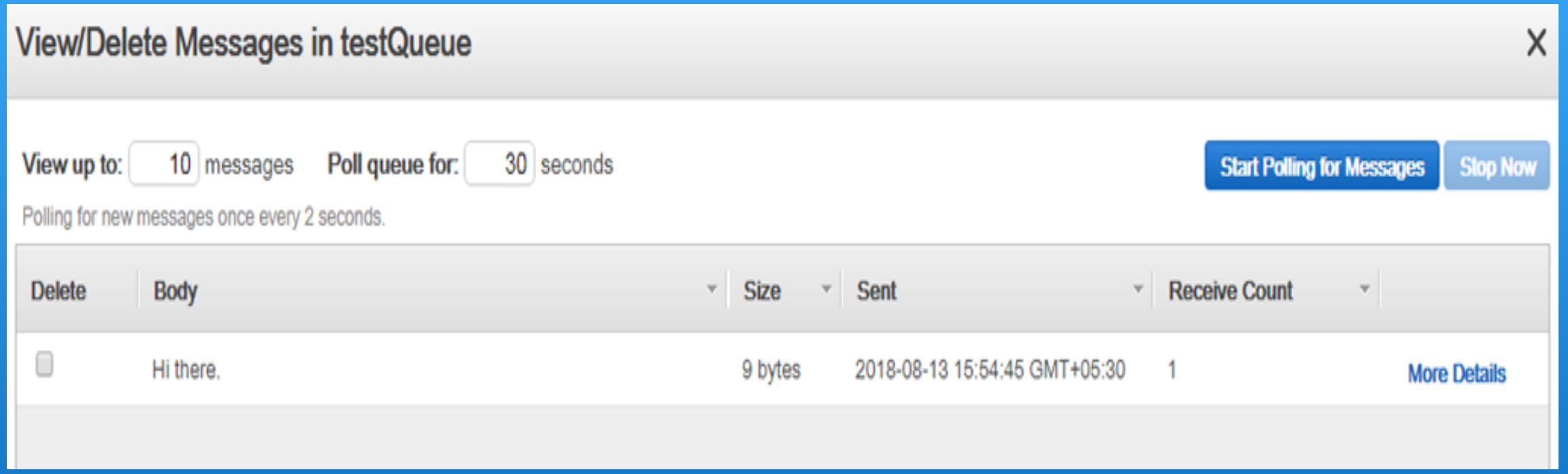


SWF – Simple Workflow Service

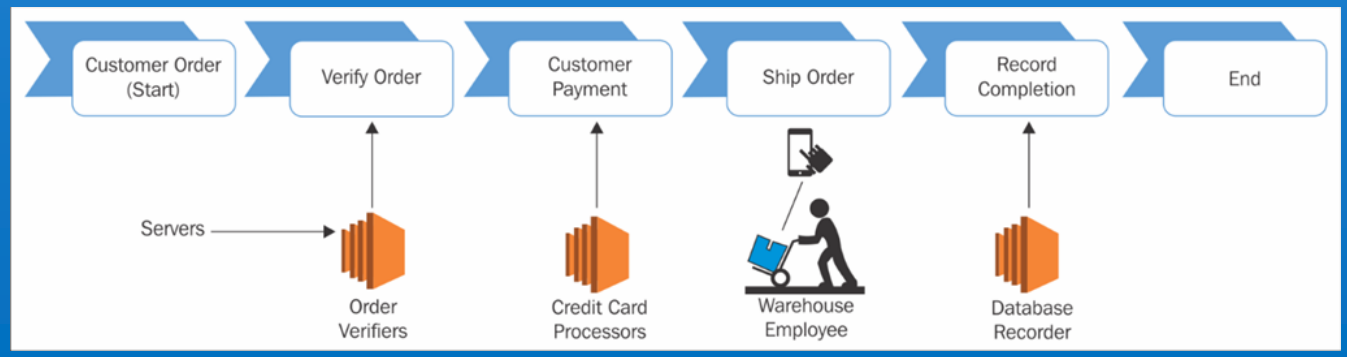
Introduction:

Amazon Simple Workflow Service (SWF) is a workflow management service that helps in building applications that can handle work through distributed components.

Using SWF, you can define a number of tasks that can be executed in a predefined sequence.

Use cases for SWF:

Customer order processing workflow
Business process workflow
Analytics pipelines



SWF – Simple Workflow Service(Conti...)

Core concepts of SWF:

Workflow:
It is a mechanism to execute a number of distributed application tasks in an asynchronous way.

While creating a workflow, you need to determine the tasks to be executed in the workflow. SWF recognizes these tasks as activities.

Workflow history:
SWF keeps the history or execution progress of any workflow in the workflow history.

Once the execution of a workflow starts, SWF keeps a detailed history of each and every step of the workflow.

Whenever the workflow execution state changes, such as when a new activity is scheduled in the workflow or an activity is completed, it is represented as an event in the workflow history.

SWF – Simple Workflow Service(Conti…)

Core concepts of SWF:

Actors:

An actor is a program or an entity that performs different types of activities in a workflow.

An actor can be any of the following:

Workflow starter - is a program or an application that starts the execution of a workflow

Decider - a program or an application that decides the coordination logic of a workflow.

Activity worker - is a program or an application that receives tasks from SWF, executes the tasks, and returns the result back to SWF

SWF – Simple Workflow Service(Conti…)

Core concepts of SWF:

Tasks - The work assignments that SWF provides to activity workers and deciders are called tasks.

AWF Domain - Domains in SWF are a mechanism to scope SWF resources such as workflows, activity types, and workflow execution.
All the resources are scoped to a domain.

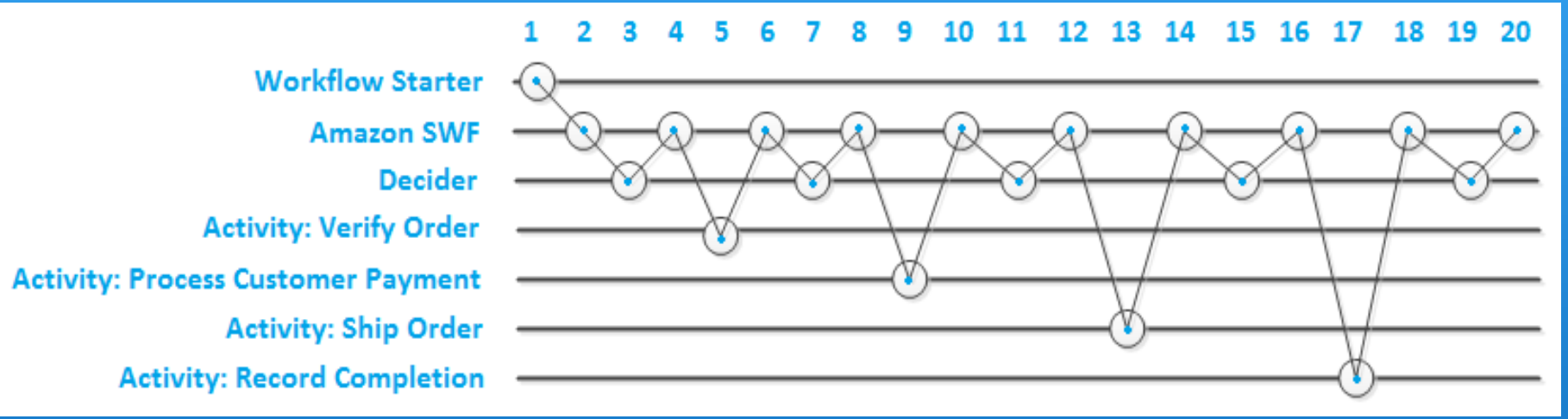
Task List - Task lists are a mechanism to organize different tasks related to a workflow. Task lists can be thought of like dynamic queues.

Workflow execution closure - When a workflow execution is started, it changes an open state. An open workflow execution can be closed as one of the following:

- Completed
- Canceled
- Failed
- Timed out

SWF – Simple Workflow Service(Conti…)

Life cycle of workflow execution:



Summary

In this chapter, we have gone through following topics

- SNS – Simple Notification Service
- SQS – Simple Queuing Service
- SWF – Simple Workflow Service

See you soon…