

Serverless Data Processing (CSCI 5410)

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What is Amazon SQS?

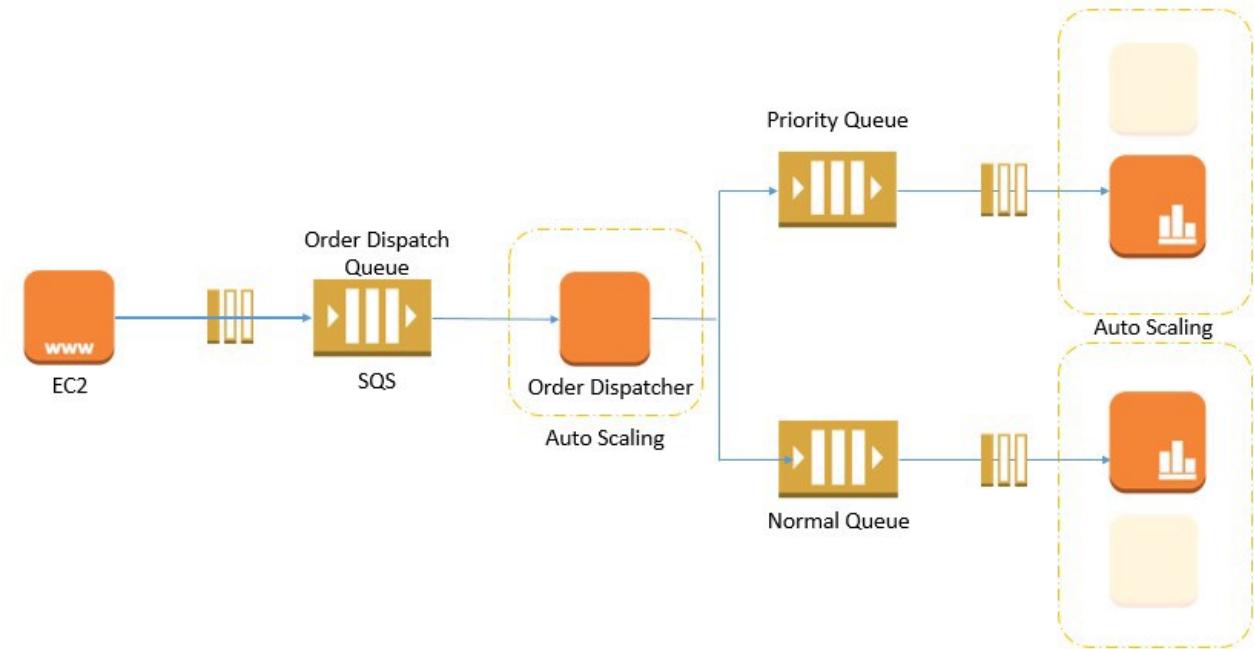
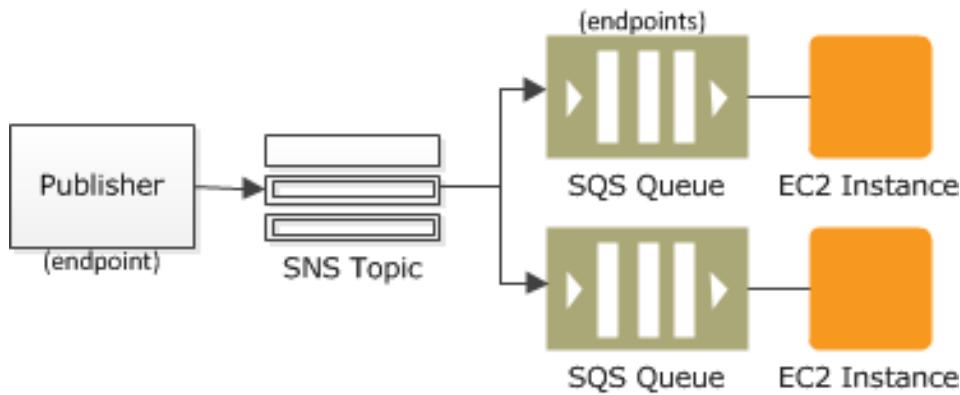
- Amazon Simple Queue Service (SQS) is a fully managed message queuing service that enables you to decouple and scale microservices, distributed systems, and serverless applications.
- We can send, store, and receive messages between software components at any volume, without losing messages or requiring other services to be available.

Difference between Amazon SNS & Amazon SQS

- SNS is a push notification service. It can be used to send individual message or bulk messages to the subscribers
- SNS is a distributed publish-subscribe system.
- It supports many end points, such as email, SMS, HTTP end point and SQS.

- SQS does not push messages to receivers. Amazon SQS provides short polling and long polling to receive messages from a queue
- SQS is a distributed message queueing service.
- HTTP for standard and HTTPS end point for S3 services

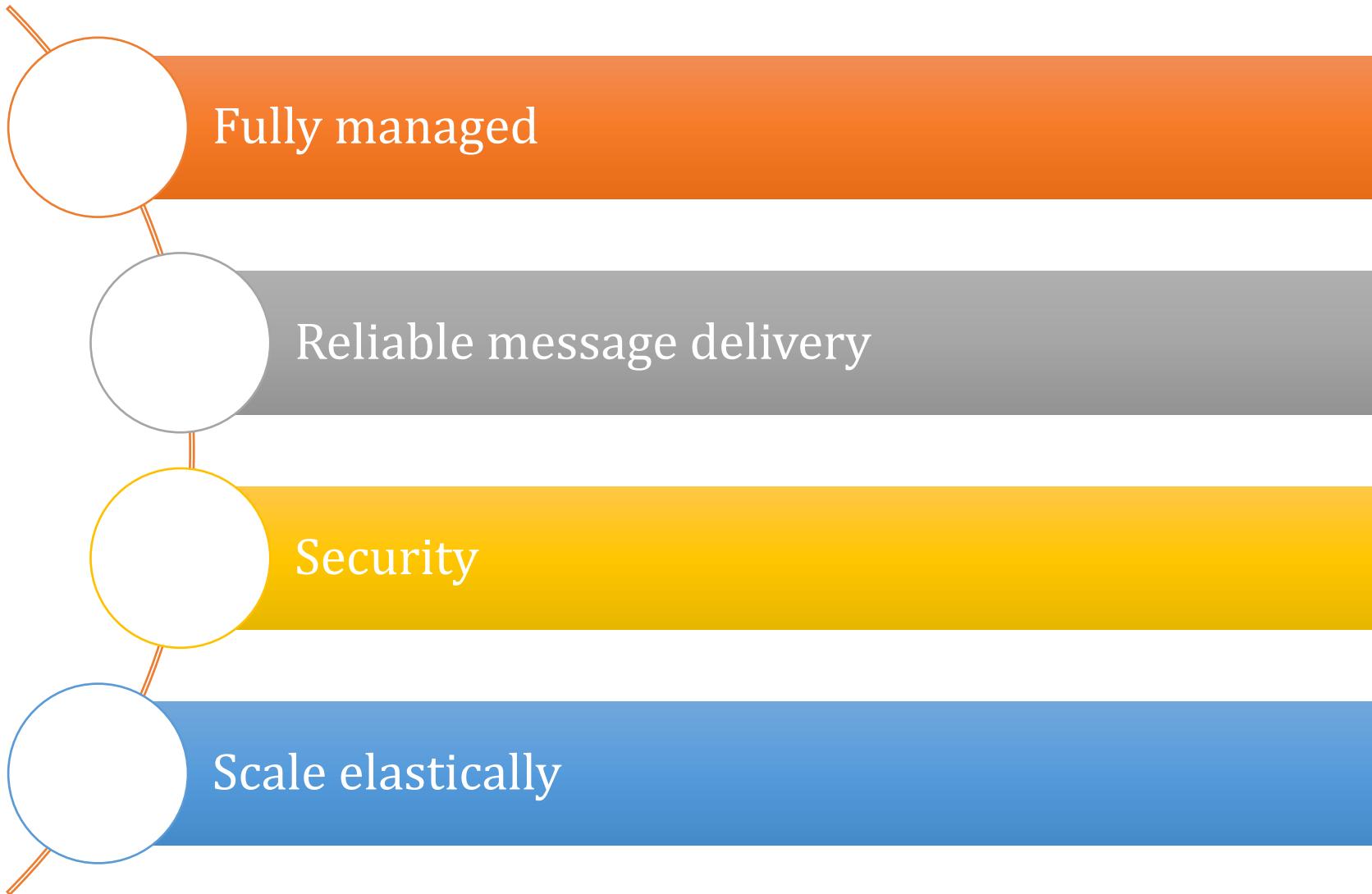
SNS and SQS Scenarios



<https://docs.aws.amazon.com/sns/latest/dg/sns-common-scenarios.html>

<https://medium.com/awesome-cloud/aws-difference-between-sqs-and-sns-61a397bf76c5>

Benefits of Amazon SQS



SQS FIFO Queues

- FIFO (First-In-First-Out) queues are designed to enhance messaging between applications when the order of operations and events is critical, or where duplicates can't be tolerated. Some examples are -
 - Ensure that user-entered commands are executed in the right order.
 - Display the correct product price by sending price modifications in the right order.
- To create a SQS Queue we use “CreateQueue”, and to specify if it is a “FifoQueue”, we need to add an attribute with value “True” or “False”

<https://sns.us-east-2.amazonaws.com/?Action/CreateQueue&QueueName=MyQueue&Tag.Key=QueueType&Tag.Value=Production&Attribute.1.Name=VisibilityTimeout&Attribute.1.Value=40&Expires=2020-10-18T22%3A52%3A43PST&Version=2012-11-05&AUTHPARAMS>



vocstartsoft/user497090=saur...

N. Virginia

S

Queue Name ⓘ

serverlessLecture

Region ⓘ US East (N. Virginia)

What type of queue do you need?

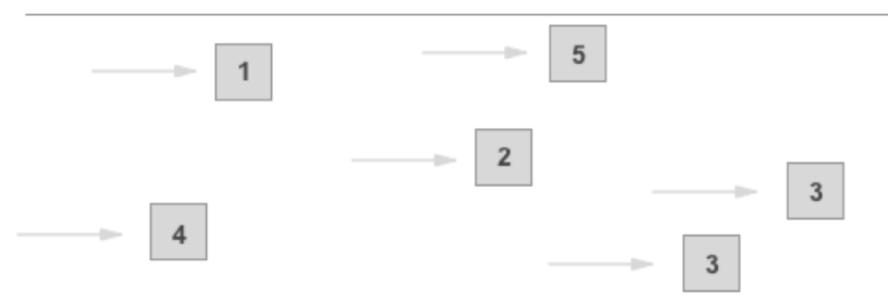
Standard Queue

FIFO Queue

Unlimited Throughput: Standard queues support a nearly unlimited number of transactions per second (TPS) per API action.

At-Least-Once Delivery: A message is delivered at least once, but occasionally more than one copy of a message is delivered.

Best-Effort Ordering: Occasionally, messages might be delivered in an order different from which they were sent.



High Throughput: FIFO queues support up to 300 messages per second (300 send, receive, or delete operations per second). When you batch 10 messages per operation (maximum), FIFO queues can support up to 3,000 messages per second. To request a limit increase, file a support request.

First-In-First-out Delivery: The order in which messages are sent and received is strictly preserved.

Exactly-Once Processing: A message is delivered once and remains available until a consumer processes and deletes it. Duplicates are not introduced into the queue.



You can change these default parameters.

Queue Attributes

Default Visibility Timeout  seconds ▾ Value must be between 0 seconds and 12 hours.

Message Retention Period  days ▾ Value must be between 1 minute and 14 days.

Maximum Message Size  KB Value must be between 1 and 256 KB.

Delivery Delay  seconds ▾ Value must be between 0 seconds and 15 minutes.

Receive Message Wait Time  seconds Value must be between 0 and 20 seconds.

Dead Letter Queue Settings

Use Redrive Policy 

Dead Letter Queue  Value must be an existing queue name.

Maximum Receives  Value must be between 1 and 1000.

Server-Side Encryption (SSE) Settings

Use SSE 

AWS KMS Customer Master Key (CMK) 

Data Key Reuse Period  This value must be between 1 minute and 24 hours.

Amazon Simple Queue Service (SQS) Queue Overview				
Filter by Prefix:		Actions		
Name	Type	Content-Based Deduplication	Messages Available	Last Message Sent
serverlessLecture	Standard	N/A	0	2020-07-06 10:02:49 GMT-03:00

1 SQS Queue selected

Details	Permissions	Redrive Policy	Monitoring	Tags	Encryption	Lambda Triggers
<p>Name: serverlessLecture</p> <p>URL: https://sq.s.us-east-1.amazonaws.com/357827796551/serverlessLecture</p> <p>ARN: arn:aws:sqs:us-east-1:357827796551:serverlessLecture</p> <p>Created: 2020-07-06 10:02:49 GMT-03:00</p> <p>Last Updated: 2020-07-06 10:02:49 GMT-03:00</p> <p>Delivery Delay: 0 seconds</p> <p>Queue Type: Standard</p> <p>Content-Based Deduplication: N/A</p>	<p>Default Visibility Timeout: 30 seconds</p> <p>Message Retention Period: 4 days</p> <p>Maximum Message Size: 256 KB</p> <p>Receive Message Wait Time: 0 seconds</p> <p>Messages Available (Visible): 0</p> <p>Messages in Flight (Not Visible): 0</p> <p>Messages Delayed: 0</p>					

ue
rojects.cs.dal.ca/printq/?printer=

Send a message to serverlessLecture

X

Message Body Message Attributes

Enter the text of a message you want to send.

Hello this is a test message

Delay delivery of this message by seconds ▾ (up to 15 minutes).

Cancel Send Message

Send a Message to serverlessLecture

X

Message Body Message Attributes

Enter the text of a message you want to send.

Hello this is my second message in the queue

Delay delivery of this message by seconds ▾ (up to 15 minutes).

Cancel Send Message

1

2

View/Delete Messages in serverlessLecture

X

View up to: **10** messages Poll queue for: **30** seconds

Polling for new messages once every 2 seconds.

Start Polling for Messages

Stop Now

Delete

Body

Size | Sent

Receive Count

View messages currently available in the queue by clicking the *Start Polling for Messages* button.

- Messages will come from the front of the queue unless other applications are also reading from the queue.
- Messages displayed in the console will not be available to other applications until the console stops polling for messages.
- The console will stop polling for messages as soon as the specified number of seconds have elapsed, the requested number of messages have been received, or the *Stop Now* button has been pressed.
- Deleting a message from the console permanently removes it from the queue.

Don't show this again.

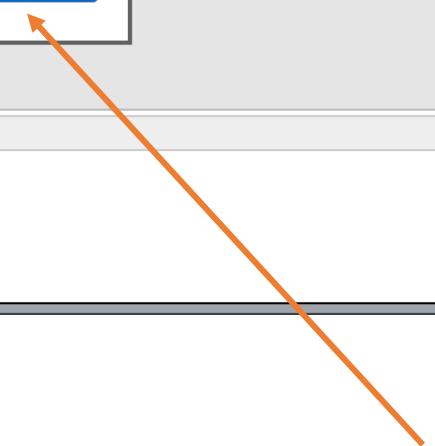
Start Polling for Messages

0%

This progress bar indicates whether messages displayed above are available to applications.

Close

Delete Messages



View/Delete Messages in serverlessLecture

View up to: 10 messages Poll queue for: 30 seconds

Polling for new messages once every 2 seconds.

Delete	Body	Size	Sent	Receive Count	
<input type="checkbox"/>	Hello this is my second message in the queue	44 bytes	2020-07-06 10:09:15 GMT-03:00	1	More Details
<input type="checkbox"/>	Hello this is a test me			1	More Details

Message Details

Message Body Message Attributes

Hello this is my second message in the queue

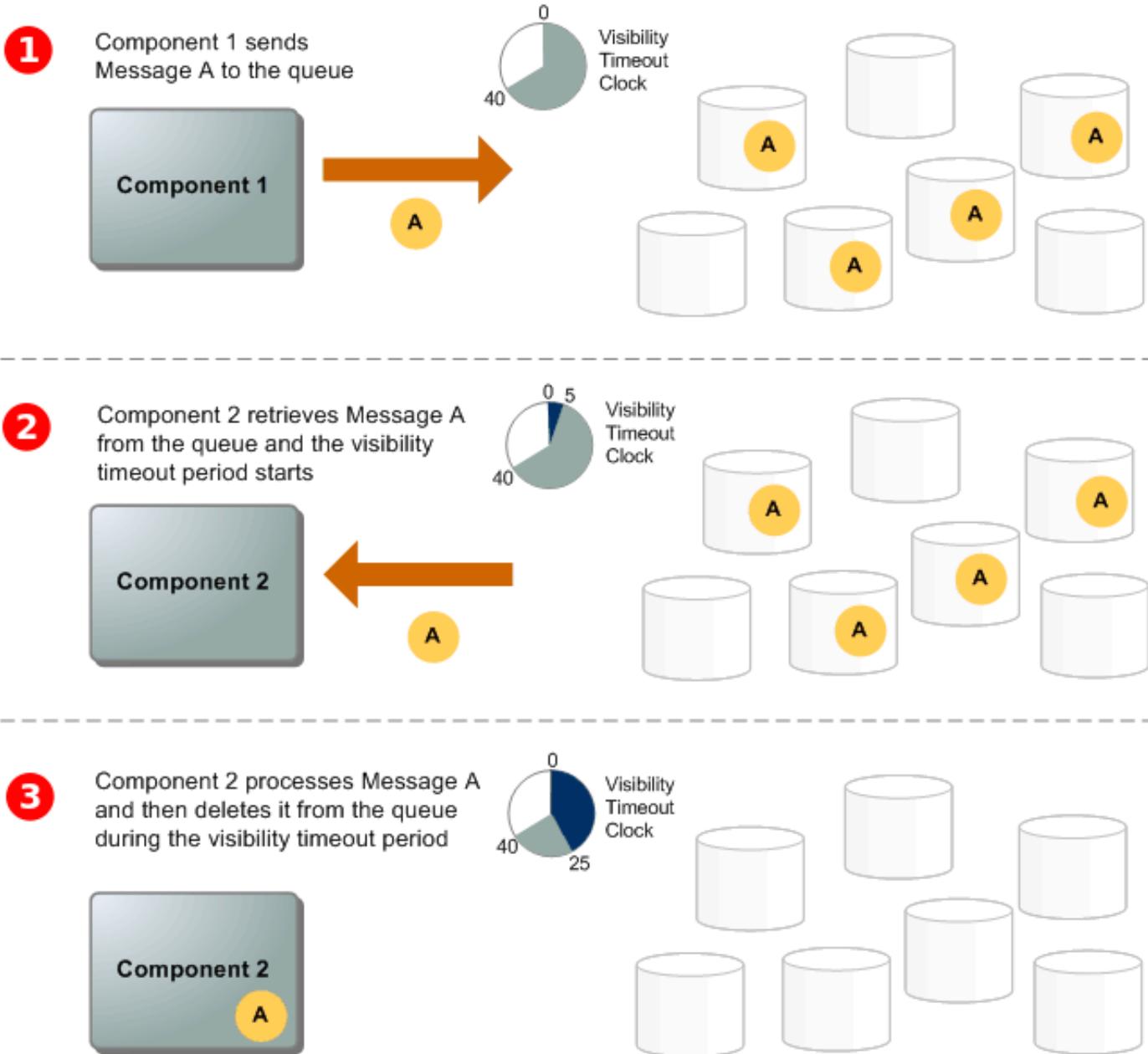
Message ID: ddaf9159-dc8c-4c11-9e24-a3a70fd3b90a
Size: 44 bytes
MD5 of Body: 11d0b4d08f67e9a66b01a32f3cd306e5
Sender Account ID: AROAVGUBS3ZDSFEZSXCRL:user497090=saurabh.dey@dal.ca
Sent: 2020-07-06 10:09:15.095 GMT-03:00
First Received: 2020-07-06 10:10:03.971 GMT-03:00
Receive Count: 1
Message Attribute Count: 0

[Close](#) [Delete Messages](#)

Polling the queue at 0.6 receives/sec

SQS Architecture

- There are three main parts in a distributed messaging system:
 - the components of your distributed system,
 - your queue (distributed on Amazon SQS servers),
 - and the messages in the queue.



Amazon SQS short and long polling

