



# Amazon - SQS



## What is Amazon SQS?

“Amazon Simple Queue Service (SQS) is a fully managed message queuing service that enables to decouple and scale micro services and serverless applications.

SQS eliminates the complexity and overhead associated with managing and operating message oriented middleware, and empowers developers to focus on work.”

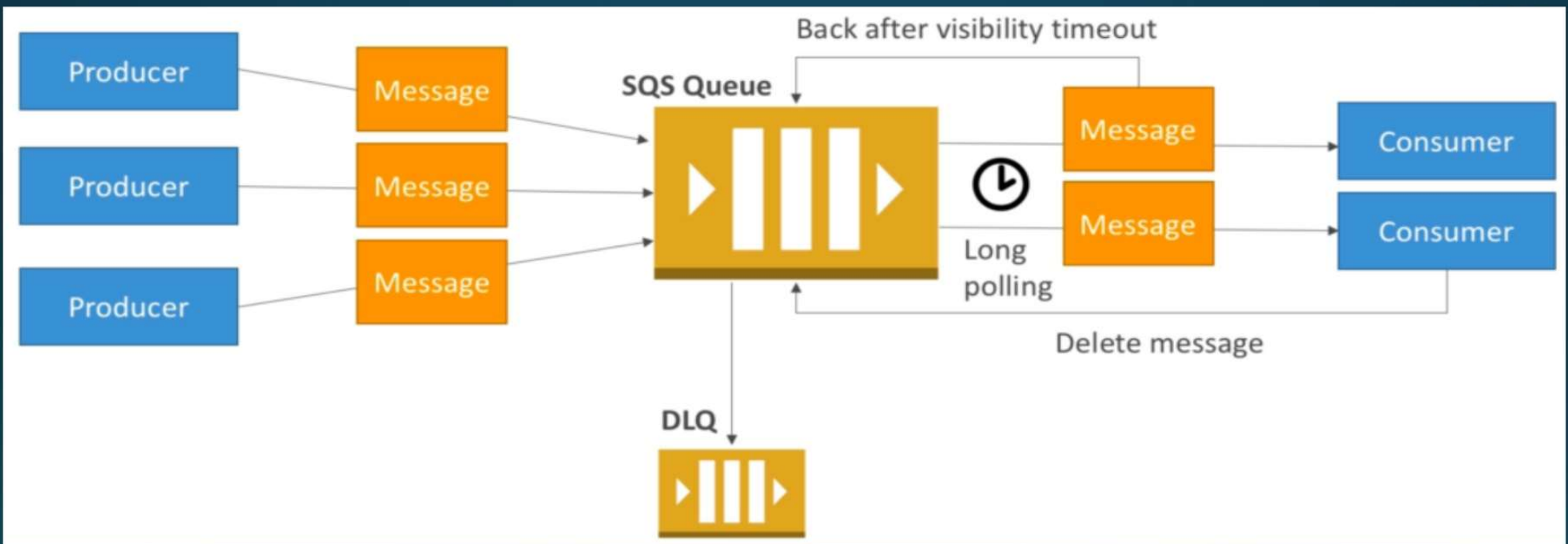


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## What is Amazon SQS?

- One of the oldest service or may be the first service.
- November 2004, the first AWS service launched for public usage: Simple Queue Service
- It's a type of buffer.
- Fast, reliable and fully managed service.
- A queue is a temporary repository messages that are waiting to be processed.
- You can delete all the messages in queue without deleting the SQS itself.
- You can use applications on EC2 instances to read and process the SQS messages.



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## ☰ SQS Use Case

- A video transcoding website uses EC2, SQS, S3, and DynamoDB together.
- User uploaded videos to the website.
- Videos are stored in Amazon S3 and message is placed in SQS to transcode video.
- Transcoded engine runs on a set of EC2 instances, reads messages from SQS, retrieve video from S3 and transcodes the video into target format.
- Converted video uploaded in another S3 bucket, message is placed in another SQS for further processing.
- At the same time, metadata about the video indexed into DynamoDB for querying.
- During this workflow Autoscaling adjusts the number of EC2 instances to meet response.
- Example use cases include bank transaction logs, stock tickers, flight trackers, price updates, news broadcasting, and inventory management.

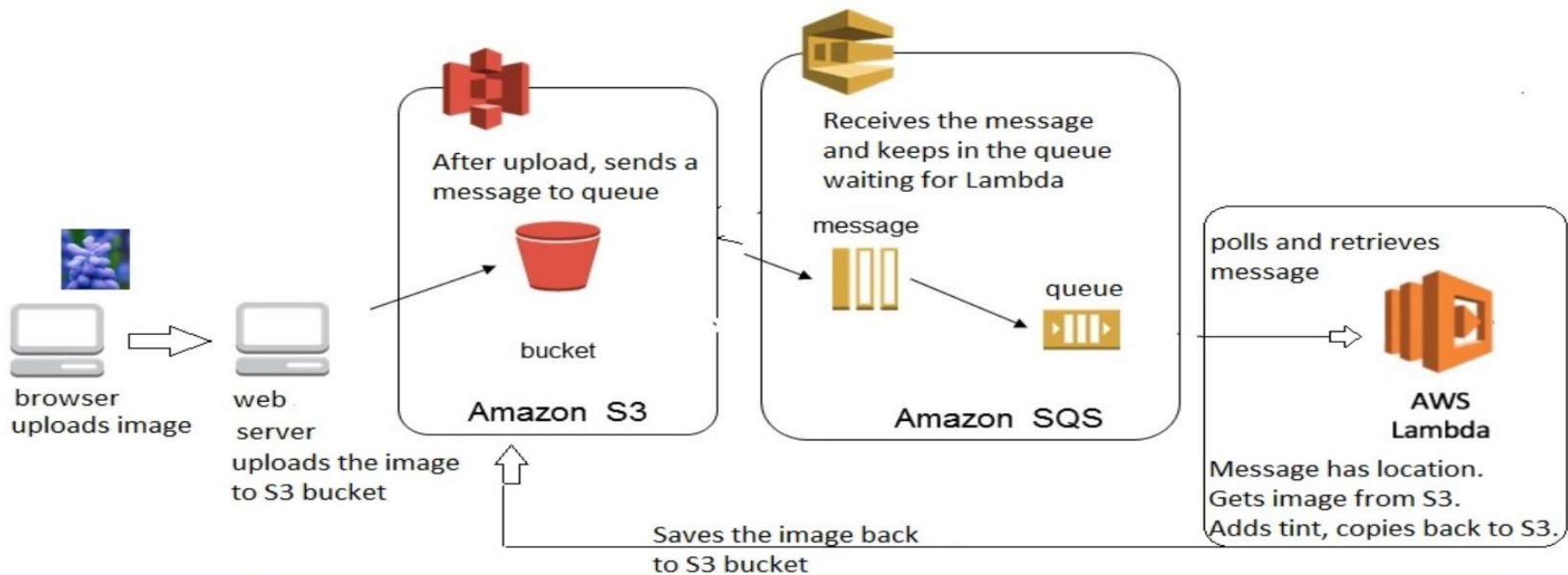


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## Amazon SQS Queue Types

SQS offers two types of message queues.

- **Standard queues** offer maximum throughput, best-effort ordering, and at-least-once delivery.
- **FIFO queues** are designed to guarantee that messages are processed exactly once, in the exact order that they are sent.



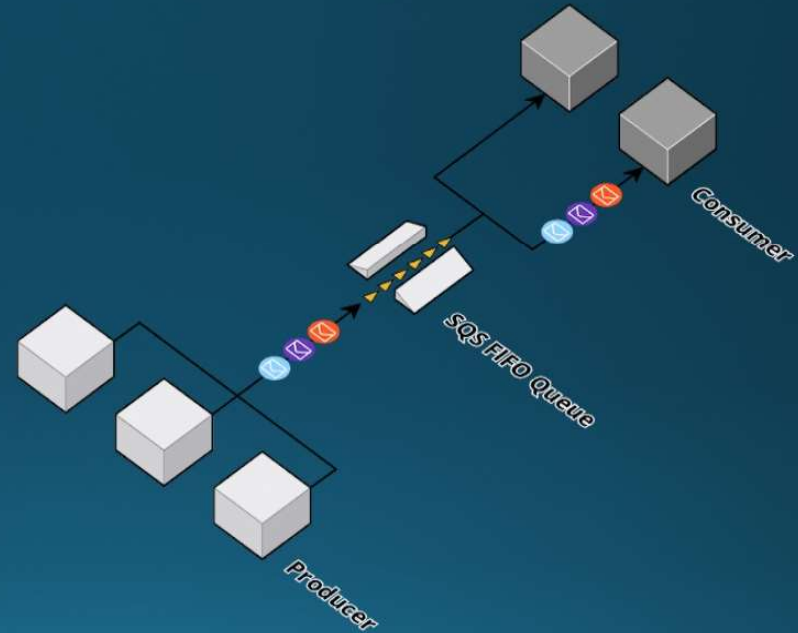
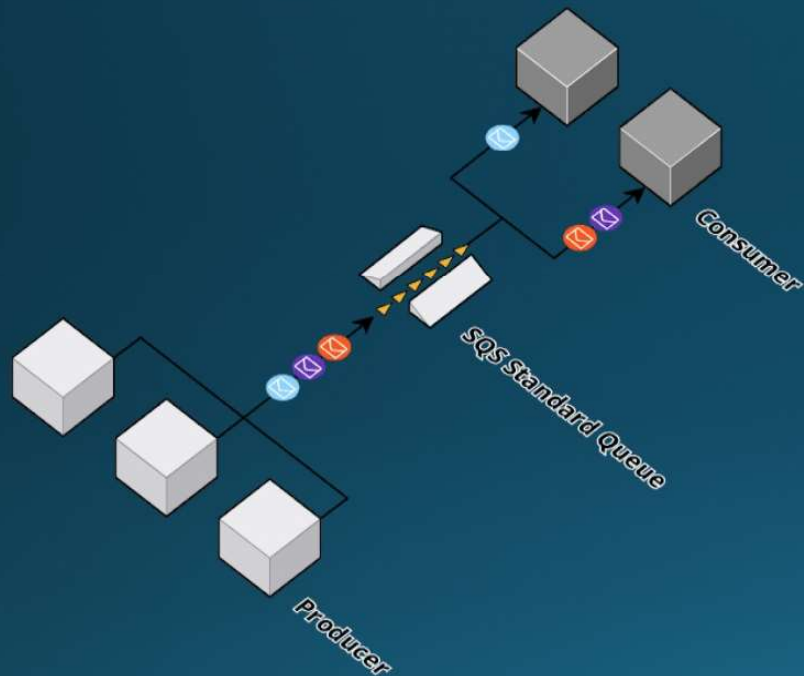
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## SQS Queue Types | Standard Queue

**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.



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## SQS Queue Types | FIFO Queues

**Unlimited queues and messages:** Create unlimited Amazon SQS queues with an unlimited number of message in any region.

**Payload Size:** Message payloads can contain up to 256KB of text in any format. Each 64KB 'chunk' of payload is billed as 1 request.

**Exactly-Once Processing:** A message is delivered once and remains available until a consumer processes and deletes it.



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## Amazon SQS Functionality

High Throughput: By default, FIFO queues support up to 300 messages per second (300 send, receive, or delete operations per second). High throughput mode for FIFO queues, allowing you to process up to 3000 messages per second per API action.

Batches: Send, receive, or delete messages in batches of up to 10 messages or 256KB. Batches cost the same amount as single messages, meaning SQS can be even more cost effective for customers that use batching.



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## Amazon SQS Functionality

Long polling: When queue is empty, long-poll requests wait up to 20 seconds for the next message to arrive. Long poll requests cost the same amount as regular requests.

Message locking: When a message is received, it becomes “locked” while being processed. This keeps out other computers from processing the message simultaneously.

If the message processing fails, the lock will expire and the message will be available again.



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## Amazon SQS Functionality

### Dead Letter Queues (DLQ):

- Handle messages that have not been successfully processed by a consumer with Dead Letter Queues.
- When the maximum receive count is exceeded for a message it will be moved to the DLQ associated with the original queue.
- User can Set up separate consumer processes for DLQs which can help analyze and understand why messages are getting stuck.
- DLQs must be of the same type as the source queue (standard or FIFO).



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## Amazon SQS with other AWS web services

**Scalability:** Because message queues decouple processes, it's easy to scale up the send or receive rate of messages - simply add another process.

**Resiliency:** When part of the system fails, it doesn't need to take the entire system down. Message queues decouple components of the system, so if a process that is reading messages from the queue fails, messages can still be added to the queue to be processed when the system recovers.



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