



SQS and SNS

- Introduction to SQS(Standard and FIFO)
- Producing and Consuming message
- Message Visibility timeout
- Long polling
- Introduction to SNS
- SNS + SQS: Fan Out
- SNS – FIFO Topic
- Message Filtering



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Introduction to SQS(Standard and FIFO)

- SQS stands for Simple Queue Service
- Fully managed service for decoupling applications(when 2 or more applications are not directly connected)
- Oldest offering (over 10 years old)
- Features:
 - Unlimited throughput, unlimited number of messages in queue
 - Default 4 days, maximum of 14 days retention
 - Low latency and 256KB message limit
- Can have duplicate message
- Can have out of order messages.(Can be overcome by using FIFO SQS)
 - **FIFO** SQS: First In First Out SQS, which does not contain any duplicates and messages are processed in order. But provide limited throughput: 300 msg/s without batching, 3000 msg/s with batch.



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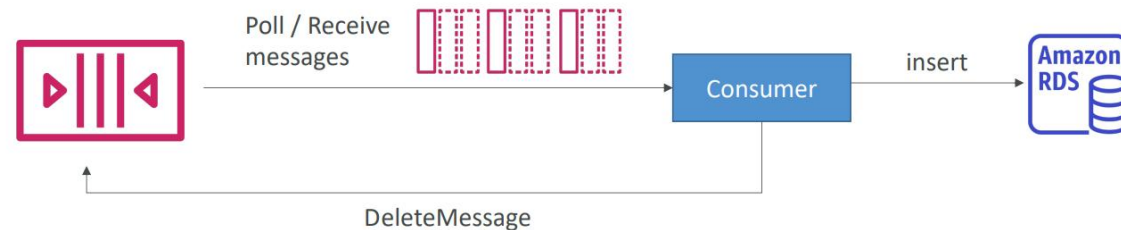
SQS - Producing and Consuming message

Producers

- Produced to SQS using the SDK (SendMessage API)
- The message is persisted in SQS until a consumer deletes it
- Example: order processing in e-commerce sites

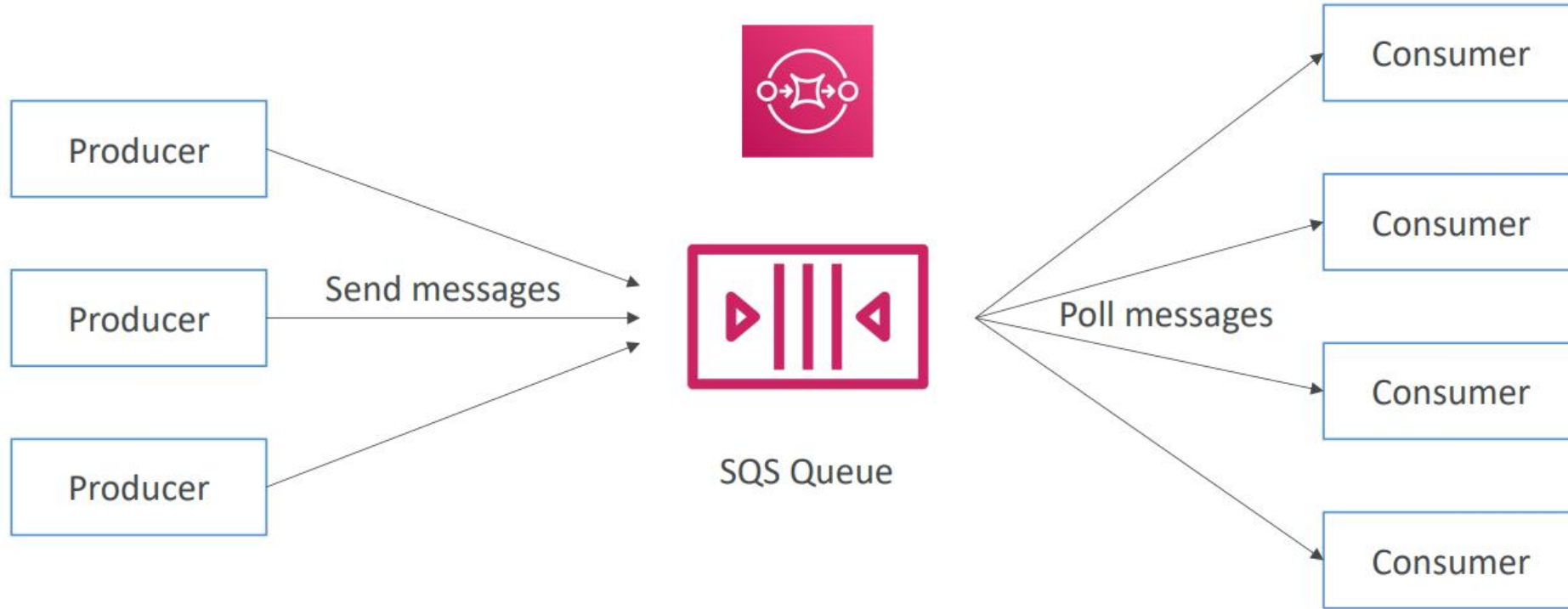
Consumer

- Consumer could be another application running on EC2 instance, Lambda or any other service.
- Consumer need to poll message from the SQS((receive up to 10 messages at a time)
- Process the message(Example: Adds the data into RDS)
- Deletes the message once it is processed using DeleteMessage API





SQS Overview Diagram



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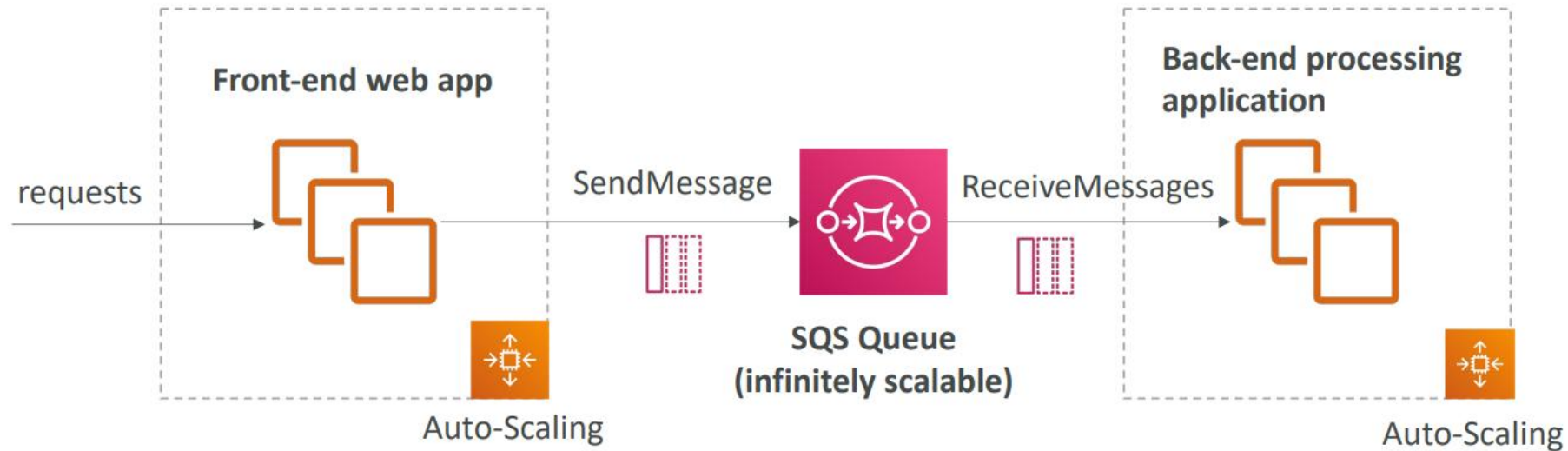
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Decoupling application using SQS





SQS - Message Visibility timeout

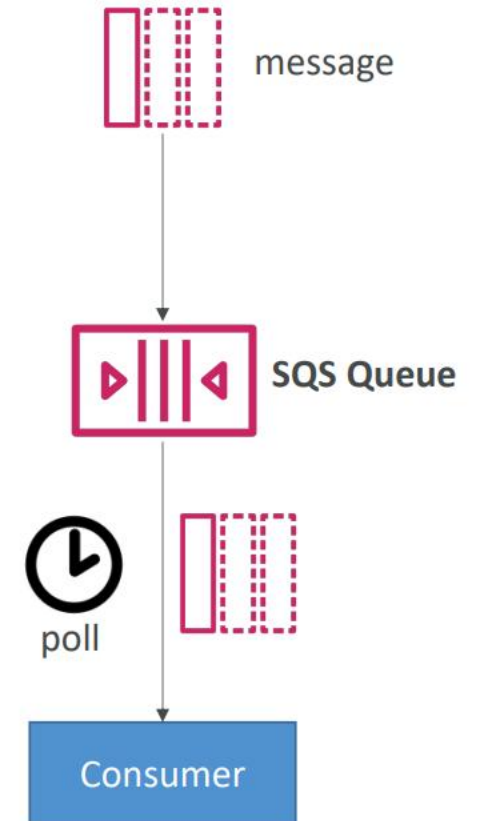
- Once a message is polled by a consumer, it becomes invisible for other consumers.
- The time for which this message is not visible to other consumer is called “Visibility timeout”, which is by default 30 seconds.
- Visibility timeout is also the limit in which a message should be processed.
- Once Visibility timeout has expired, the message will be visible to other consumers.
- If the message is not processed within the visibility timeout, it will be processed twice.
- Consumer can call ChangeMessageVisibility API to increase the visibility timeout.
- Problems:
 - If the visibility timeout is less(seconds), then message will be processed twice. It will also make more number of API calls.
 - if the visibility timeout is more(hours), and the application crashes, then it will take a long time to reprocess the message





SQS - Long polling

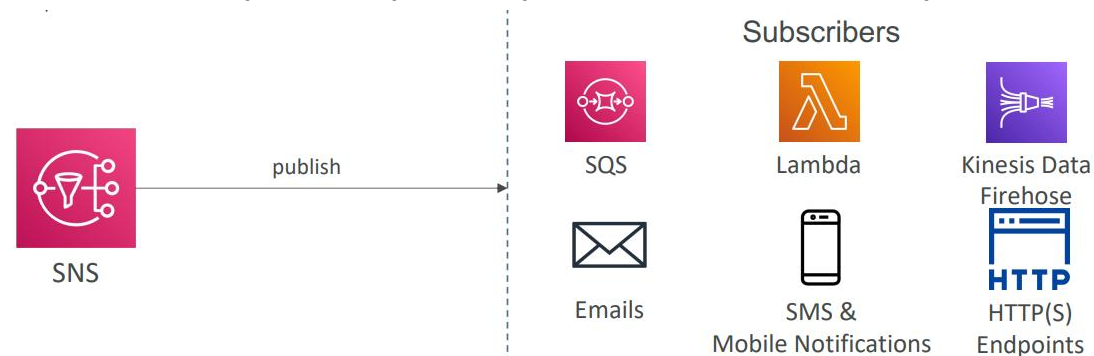
- Consumer can optionally “wait” for messages to arrive if there are none in the queue. This is called Long polling.
- LongPolling decreases the number of API calls made to SQS while increasing the efficiency and reducing latency of your application
- Wwait time can be between 1 sec to 20 sec
- Long Polling is preferable over Short Polling
- Long polling can be enabled at the queue level or at the API level using WaitTimeSeconds API





Introduction to SNS

- What if you don't want to store message but only want to send the message to different application/user ? You can use Simple Notification Service (SNS)
- SNS works in pub/sub model, which means we can have multiple publishers and multiple subscribers.
- The publisher only send the message to SNS topic. The same message gets delivered to all topic subscribers.
- Up to 12,500,000 subscriptions per topic and 100,000 topics limit



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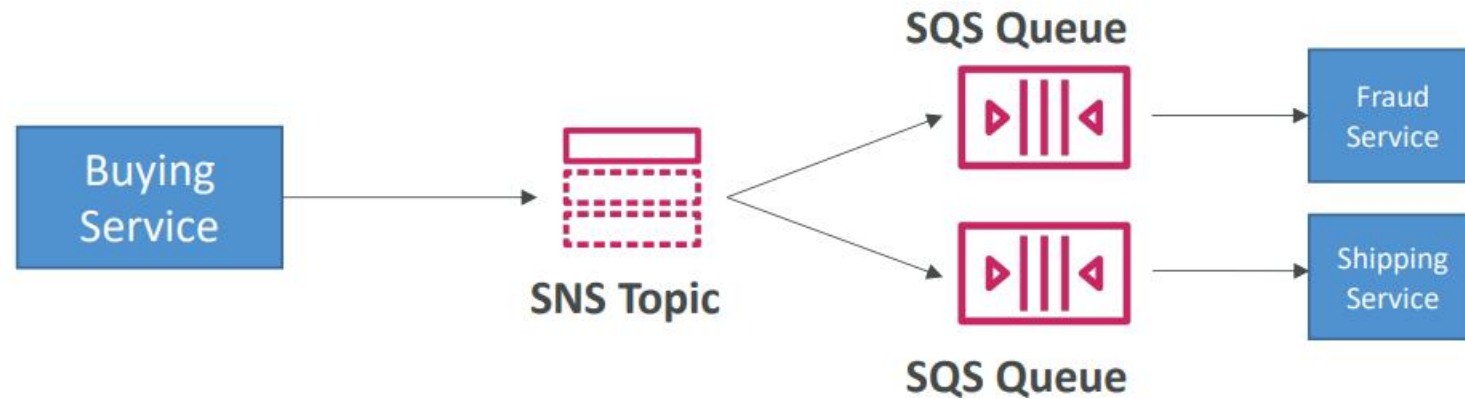


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SNS + SQS: Fan Out

- Pushing same message to different SQS at the same time using SNS is called Fan out.
- No data loss, as compared to sending same message one by one.
- Data persistence, delayed processing and retries of work
- Ability to add more SQS when required
- Make sure SQS policy allows the SNS to write
- Cross-Region Delivery: works with SQS Queues in other regions
- Similar if you use FIFO SNS and FIFO SQS, then it's called FIFO SNS + FIFO SQS: Fan out.



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SNS – FIFO Topic

- FIFO = First In First Out
- Can have SQS Standard and FIFO queues as subscribers
- Limited throughput (same throughput as SQS FIFO)
- Similar features as SQS FIFO:
 - Ordering by Message Group ID
 - Deduplication using a Deduplication ID or Content Based Deduplication



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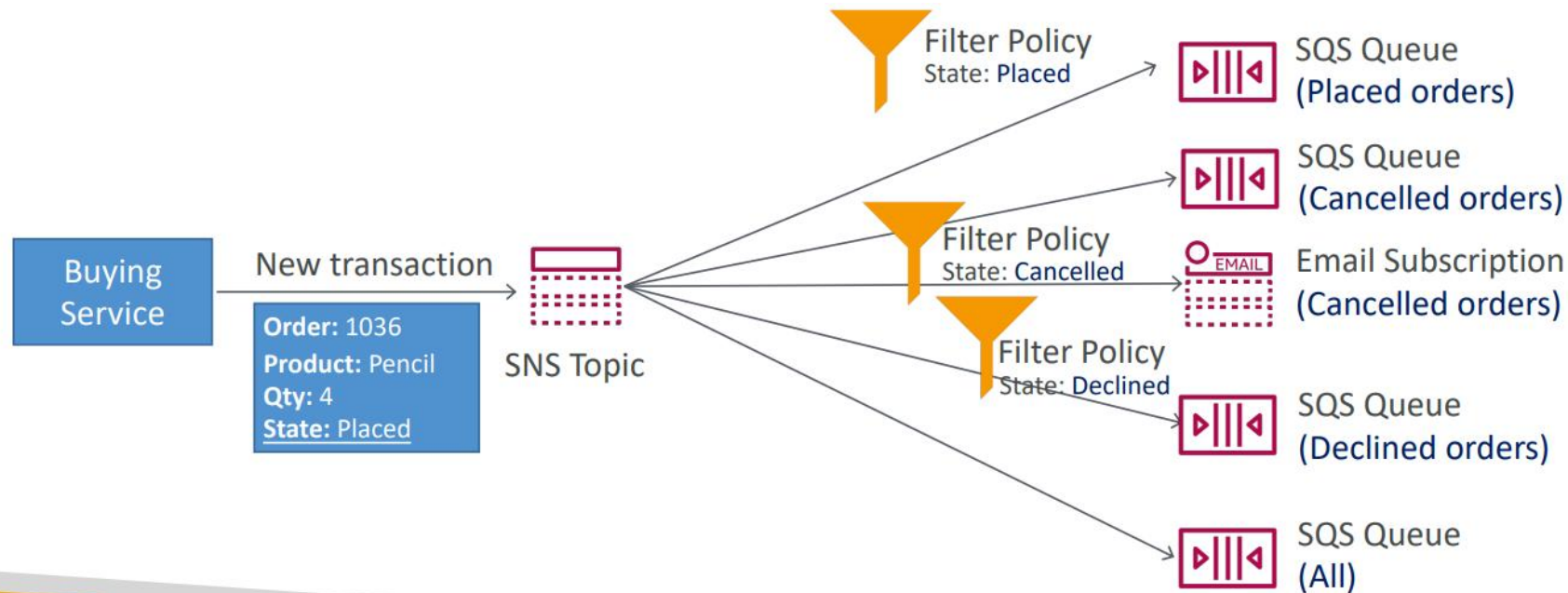


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SNS - Message Filtering

- JSON policy can be used in order to filter the message sent to different subscribers.
- If a subscription doesn't have a filter policy, it receives every message



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