AWS Messaging Services

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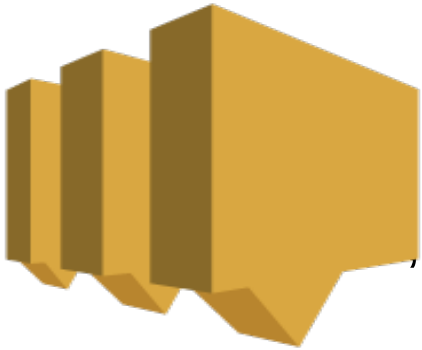
Introduction of SNS

- SNS is a flexible,fully managed pub/sub messaging and mobile notification service
- Coordinates and manages the delivery or sending of messages to subscribing endpoint or clients
- Easy to set up and operate
- Manage SNS using AWS management
  AWS CLI, AWS SDK

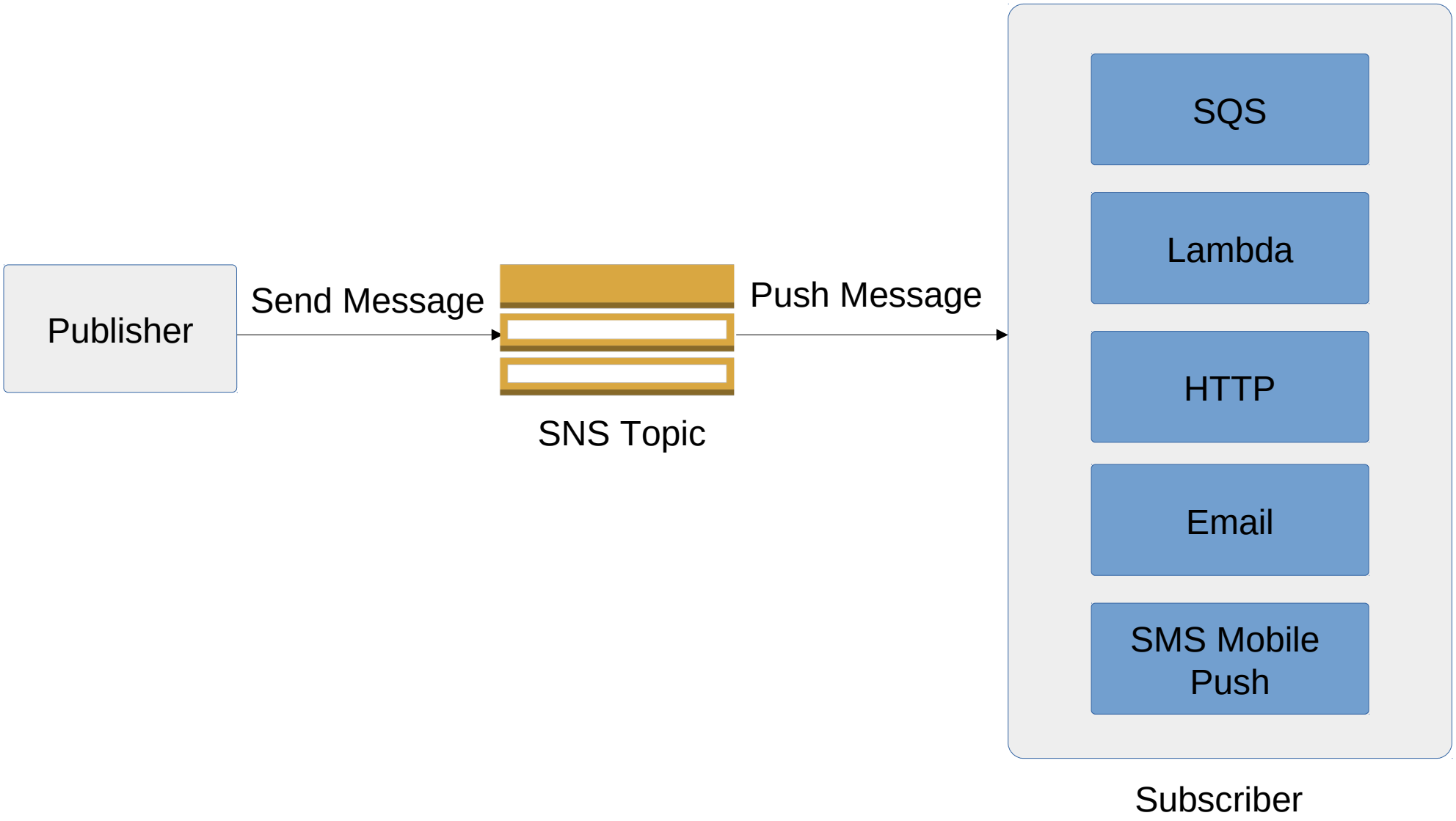


- Using SNS create a topic and control access to it by defining policies that determine which publishers and subscribers can communicate with the topic
- Amazon SNS follows push-based delivery

SNS Benefits

- **Reliable -** Topics will be available whenever applications need them
- **Scalable –** Can publish unlimited number of messages at any time
- **Simple –** Easy to use, developers can use SNS by 3 APIs
  - Create Topic
  - Subscribe
  - Publish
- **Flexible -** SNS allows to receive notifications to all applications, end users using Mobile Push Notifications, Email, HTTP, SQS and other services
- **Secure -** SNS provides Access control mechanism to protect topics and messages from unauthorized access
- **Inexpensive** – pay-as-you-go, pricing will be calculated by per-request, notification delivery, and data transfers

SNS Flow Diagram



SNS Components

- Topics
- Subscribers
- Publishers

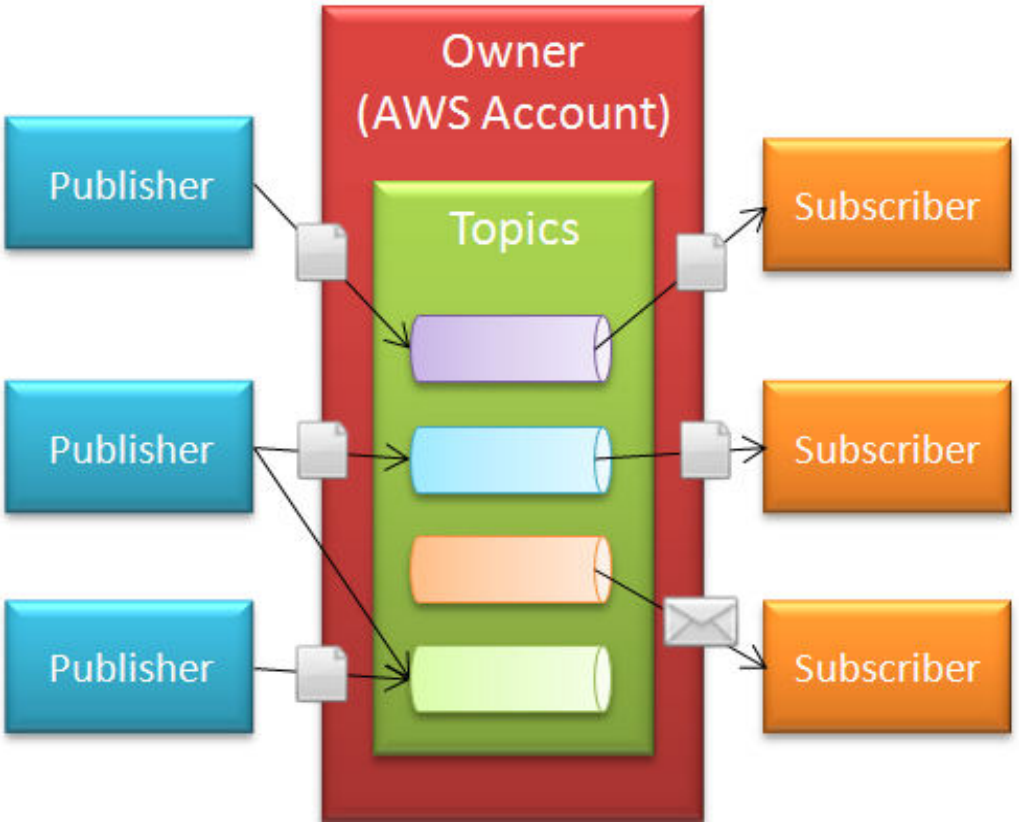
SNS Components - Topics

- Topic is like a logical access point and communication channel
- Amazon SNS topic has a unique name that identifies the Amazon SNS endpoint for publishers to post messages and subscribers to register for notifications.

- Each topics has specific subject, content, and event type

SNS Components – Publishers

- Publishers used to send messages to SNS topic
- SNS topic publish the messages to Subscribers
- Using Amazon CLI, User Applications(HTTP), SDKs and AWS Services such as Amazon EC2, Amazon S3 and Amazon Cloud-watch can publish messages to SNS topics



SNS Components - Subscribers

- Subscribers receive the messages or notifications over any one the protocols

- Here protocols are Amazon SQS, HTTP/S, email, SMS, Lambda

- Subscribers are endpoints

    - Mobile Apps
    - Web Servers
    - Email Address
    - Amazon SQS Queue
    - AWS Lambda

Managing Access to Amazon SNS Topics

- Access Controlled with Policies
- IAM Policies
- Amazon SNS Policies
- Both IAM & SNS Policies

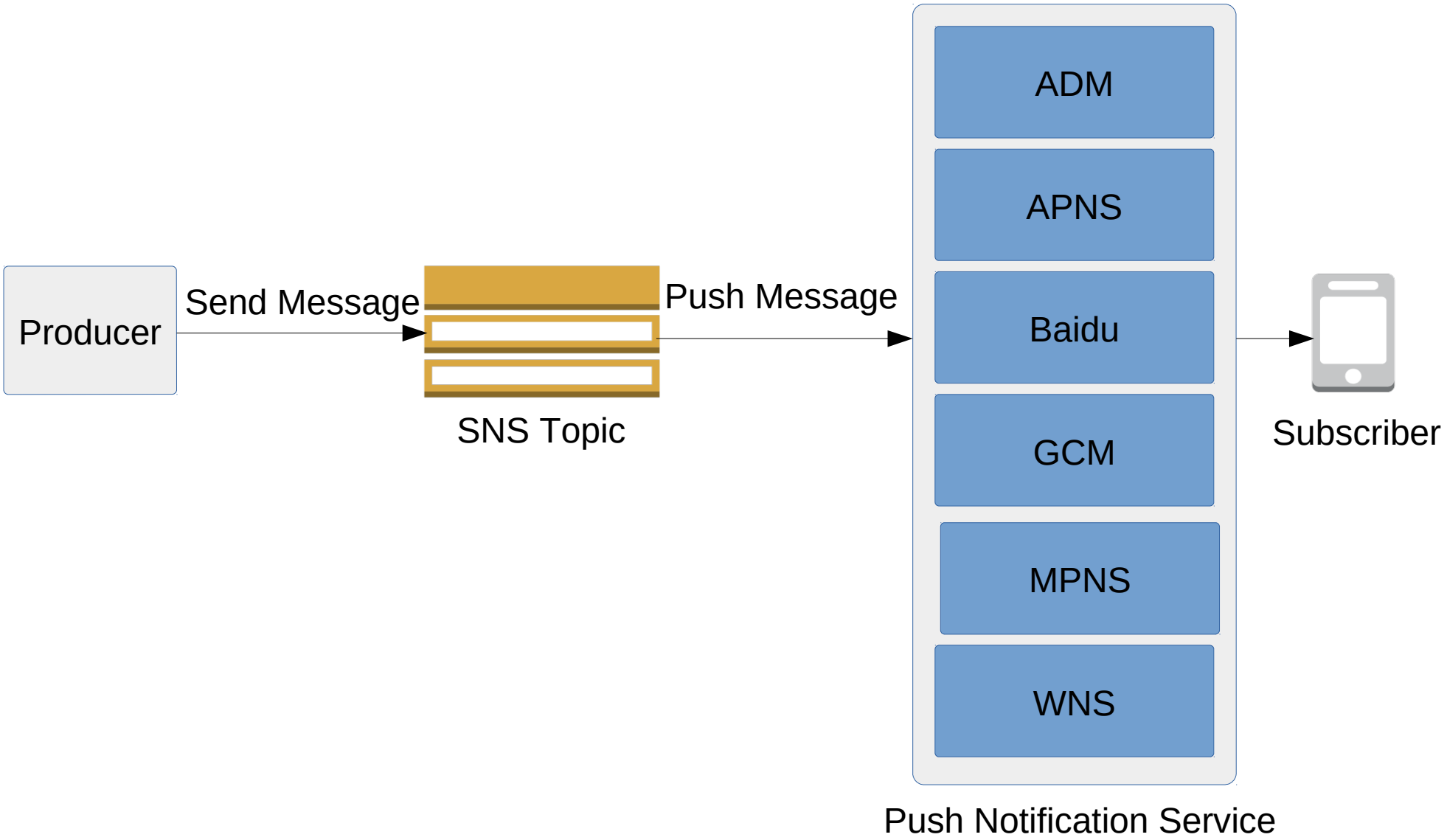
SNS policies

- SNS policy is used to control access SNS topic
- Each policy must cover only one SNS topic
- Policy id must be unique to each other
- **SNS policy Limits**
    - Size – 30 kb
    - Statements – 100
    - Principals – 1 to 200 (0 is invalid)
    - Resource – must cover 1 resource (0 is invalid)
- **SNS policy Actions**

sns:AddPermission
sns:DeleteTopic
sns:GetTopicAttributes
sns:ListSubscriptionsByTopic
sns:Publish
sns:RemovePermission
sns:SetTopicAttributes
sns:Subscribe

- **SNS Keys**
    - sns:Endpoint – URL, email address or ARN
    - sns:Protocol – https, email

SNS Mobile Push Notification Flow Diagram



SNS Key Points

- SNS sends immediate notification
- Monitoring Amazon SNS with CloudWatch
- Logging Amazon SNS API Calls By Using CloudTrail
- Sending Messages to Amazon SQS Queues

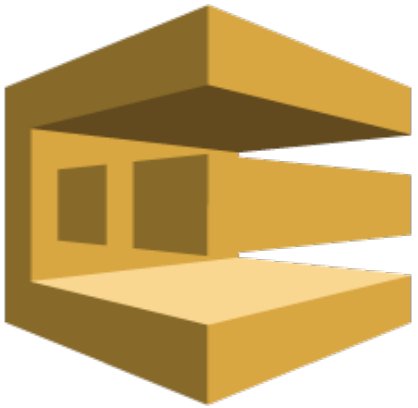
SNS Pricing

- No upfront costs and you can pay as you go
- Pay based on the number of notifications you publish and the number of notifications you deliver
- Pay based on any additional API calls for managing topics and subscription
- Numbers of subscribers the message that needs to be send
- Data transfer in/out of SNS

Introduction of SQS

- SQS(Simple Queue Service) is a highly available distributed queue system

- We can store, send and receive messages between software components at any volume, without losing messages



- SQS uses FIFO method, so every message will deliver exactly only once, and in exact order

- Amazon SQS provides familiar middle-ware constructs such as dead-letter queues and poison-pill management

SQS Benefits

Operational Efficiency

Reliability

Security

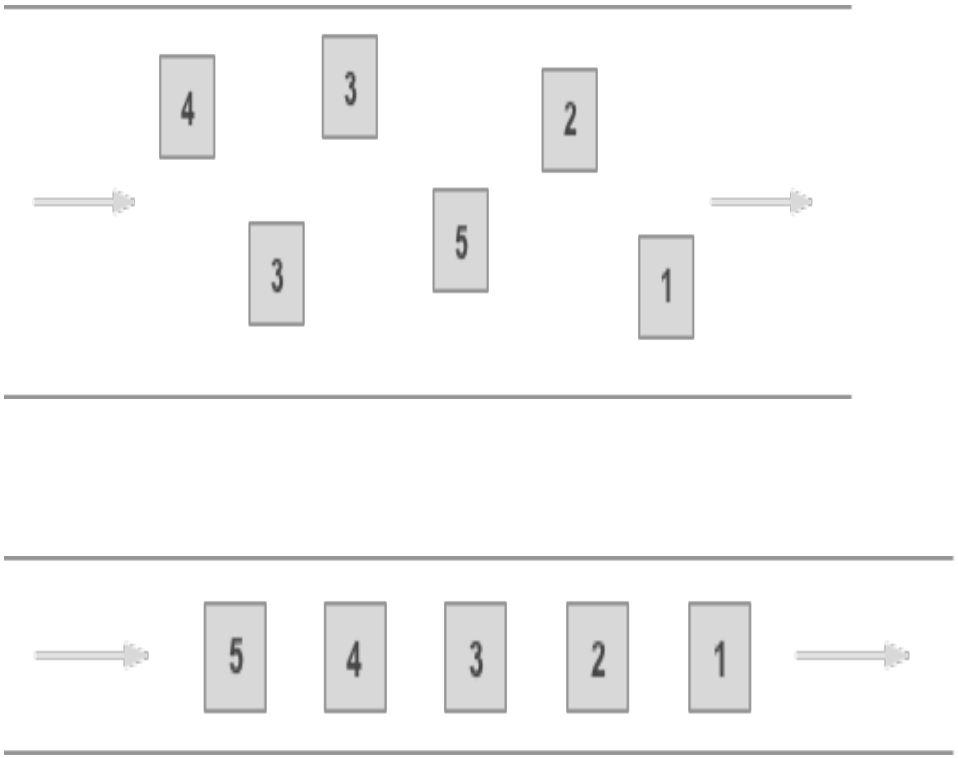
Integration

Productivity

Scalability

SQS – Queue Types

- SQS uses 2 types of queues
  - *Standard queues*
  - *FIFO queues*
- **Standard queues -**
  - At-least-once delivery
  - Best-effort ordering
  - Maximum throughput
- **FIFO queues -**
  - Exactly once delivery
  - Exact order
  - Limited throughput



SQS uses

- **Decoupling the components of an application** – Can track each item independently in queue
    - Tracks results like ACK/FAIL
- **Configuring individual message delay** – Can set up to 15 minutes delay for individual message
- **Dynamically increasing concurrency or throughput at read time** – Without pre-provisioning we can add any number of consumers
- **Scaling transparently** – Automatically scale transparently to increase load without our instruction

SQS Features

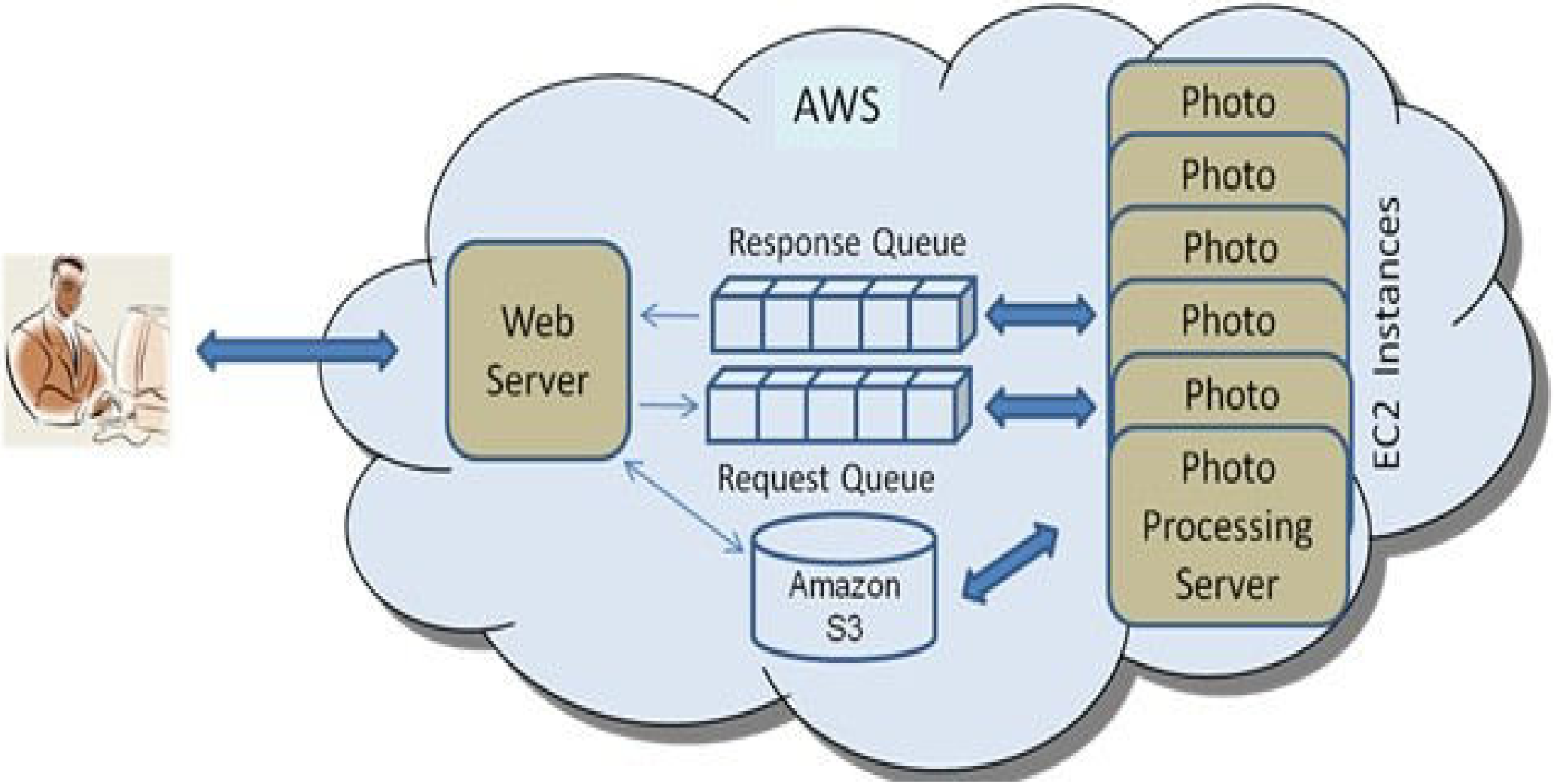
- **Redundant infrastructure** – It offers reliable and scalable hosted queues for storing messages
    - Provides ability to store messages in fail safe queue
- **At-least-once delivery** – It always ensure that it delivered messages at least once time
    - For high availability and redundancy it will store copies of all messages to multiple servers
- **Message Attributes** - message can contain up to 10 metadata attributes
    - Stores information with greater speed and efficiency
- **Message Sample** – retrieving messages from queue depends on short polling and long polling
    - **Short polling** – based on weighted policy it returns messages from server
        - Sometimes receive request might not return all messages, but subsequent request would return all messages
    - **Long polling** - request persists for the time specified and returns if the message is available

SQS Features

- **Batching** – Can do batch operations like send, receive and delete, but 10 messages in single batch
    - Helps to increases the throughput
- **Loose coupling**
- **Dead letter queues** – separate queue for messages which are not able to processed after maximum number of attempts
- **PCI Compliance** – Validated by PCI-DSS (Payment card industry – Data security Standard), it supports processing, storage and transmission of credit card data
- **Variable Message Size** – supports any format messages up to 256KB
    - Messages which have more than 256KB will be managed using S3 or DynamoDB with SQS storing pointer

Access Control – We can control access to queue, who can send message to queue, who can receive message from queue

SQS Flow Diagram



SQS Pricing

- No upfront costs and you can pay as you go
- Pay only for what you use
- The first 1 million monthly requests are free
- The pricing is based on data transferred in and out of Amazon SQS
- Pricing based on API Actions, FIFO Requests, Content of requests, Size of Payloads, Interaction with Amazon S3, Interaction with Amazon KMS

SQS Key Points

- Message Ordering
- At-Least-Once Delivery
- Consuming Messages Using Short Polling
- Multiple Writers and Readers
- PCI Compliant
- Access Control
- Delay Queues

Introduction of SES

- Amazon SES(Simple Email Service) is a email platform, which provides an easy way to send and receive emails by using user own email addresses and domains

- Amazon SES is cost effective email service built on reliable and scalable infrastructure

- Amazon SES Eliminates infrastructure challenges such as email server management, network configuration, and IP address reputation

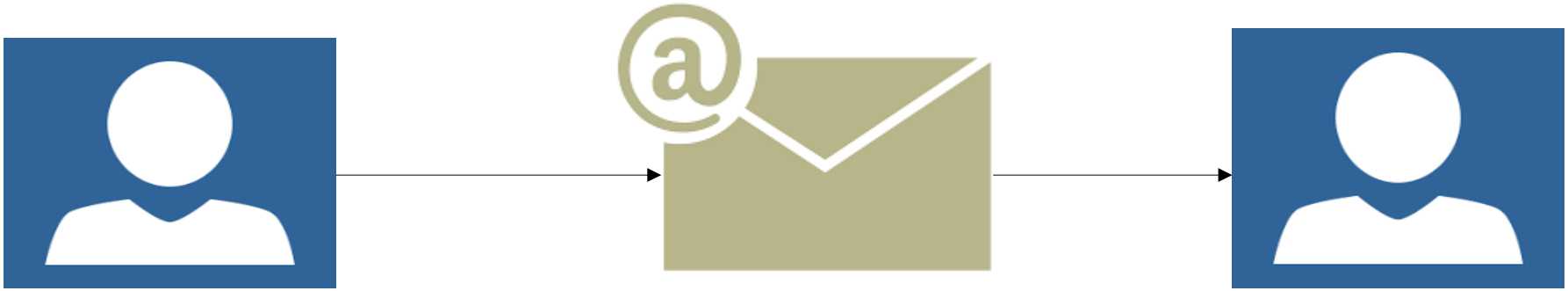
- Amazon SES SDK wraps the low-level functionality of the Amazon SES API with higher-level data types

SES – Email Services

- Amazon SES 4 Types of email services available. These are
- **Marketing Email –** To promote your products and services to your large customer base. You can send advertisements, special offers, or any other type of high-quality content
- **Transactional Email –** Automated emails such as order confirmations, policy changes

- **Notifications –** To send System health reports, application error alerts, workflow status updates
- **Receiving Emails –** To receive messages and deliver to aws services such as S3 buckets, AWS Lambda, Amazon SNS

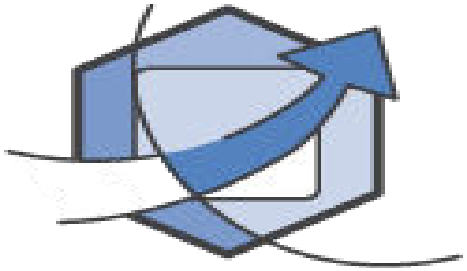
SES Flow Diagram



SES Benefits

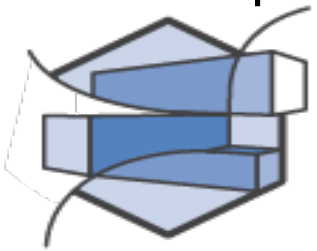
- **Reliable –** Amazon SES run Amazon Network infrastructure and Data Centers provides High Availability and Durability

- **Scalable –** Based on Cloud-Based email technology emails will be sent across the world



- **Inexpensive –** No upfront charges, Pay-as-you-go

- **Optimal Inbox Placement –** Amazon SES maximize the percentage of your emails that arrive in your recipients' Inbox.



Hands-on

SNS

- Create Topic
- Create Subscriptions

SQS

- Create queue
- Choose Standard or FIFO queue

Thank you