AWS Messaging Services

Agenda

Introduction

Amazon SQS

Amazon SNS

Amazon MQ

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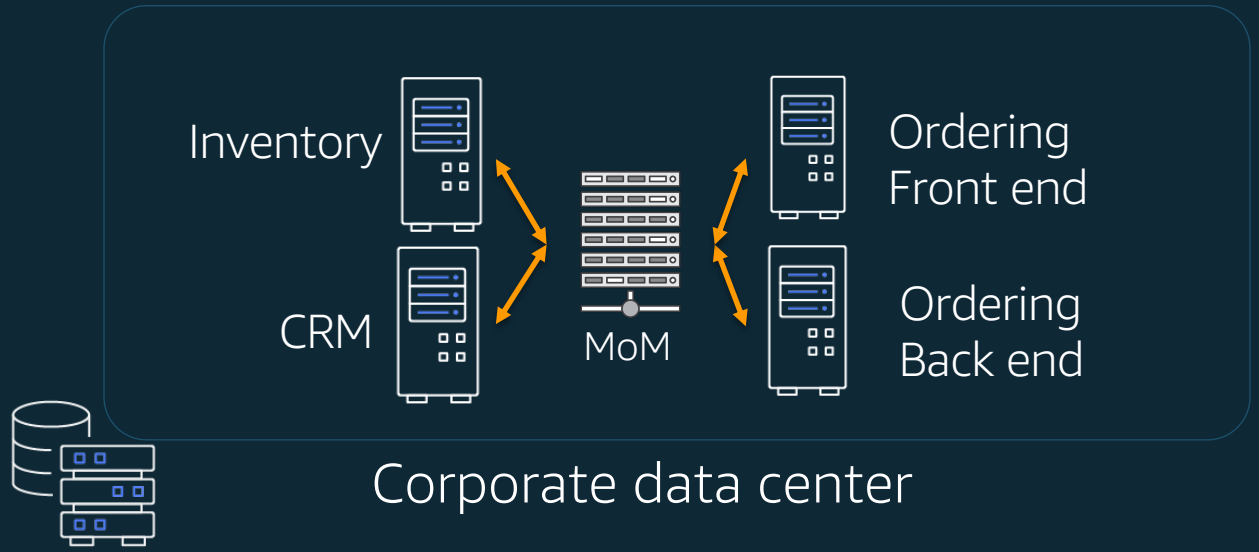
An Introduction to Messaging

Enterprise Messaging Today



Message-oriented middleware (MoM) or Message Broker

Messaging is the Backbone of Enterprise Applications

Order processing at a retailer

- Connect front-end to back-end, inventory to billing, marketing
- Ensure website operates with no delay
- Make sure no orders are ever lost

Process financial transactions at a bank

- Captures all trades and transactions
- Ensure every step is processed without failure (record keeping, analytics)
- Distribute information to third parties (transfers)

Publishing at a media company

- Capture documents for publication
- Process each step separately (reformatting, translation)
- Send documents to various destinations (web, print, third parties)

Why Do You Need Messaging?

"Loosely coupled systems"

The looser they are coupled,
the bigger they will scale,
the more fault tolerant they will be,
the less dependencies they will have,
the faster you will innovate.

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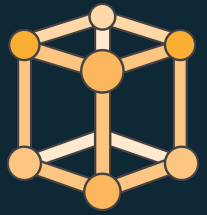
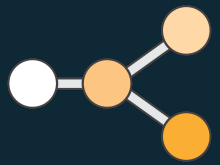
When Should You Use Messaging?



Separate parts of an application

- Web tier creates work, workers complete it
- Scale and manage tiers separately



Perform tasks asynchronously

- Long-running tasks (e.g. transcoding, transactions)
- Don’t need to wait for a response (e.g. JS web apps)
- Independent and fault-tolerant

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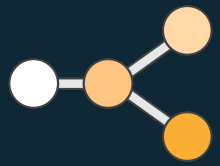
When Should You Use Messaging?



Connect multiple components or microservices

- Send individual messages or fan-out to many recipients
- Provide instant or delayed notification

Batch and burst processing

- Be resilient to spikes in traffic
- Perform work only as fast as necessary to lower costs
- Don’t lose data

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AWS Messaging: No Infrastructure to Manage

Focus on business logic, not infrastructure.

Just write your code; Amazon handles:

- Capacity
- Scaling
- Deployment
- Fault tolerance
- Monitoring
- Logging
- Security

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Messaging Use Cases

Amazon SQS

WHAT IT IS

Simple, flexible, fully managed message queuing service for reliably and continuously exchanging any volume of messages from anywhere

USE CASE

Build decoupled, highly scalable microservices, distributed systems, and serverless applications in the cloud

COOL CAPABILITIES

Nearly infinite scalability and ability to increase message throughput without pre-provisioning capacity

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Amazon SNS

WHAT IT IS

Simple, flexible, fully managed publish/subscribe messaging and notification service for high throughput, highly reliable message delivery

USE CASE

Push messages to a variety of endpoints and clients in distributed systems, microservices, and serverless applications and enable event-driven architecture

COOL CAPABILITIES

Highly reliable delivery of any volume of messages to any number of recipients across multiple protocols

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Amazon MQ

WHAT IT IS

Managed message broker service for Apache ActiveMQ that makes it easy to set up and operate message brokers in the cloud and enable hybrid architecture

USE CASE

Migrate to a managed message broker to automate software administration and maintenance, without having to re-write existing applications

COOL CAPABILITIES

Compatible with industry standard APIs and protocols, incl. JMS, NMS, AMQP, STOMP, MQTT, and WebSocket

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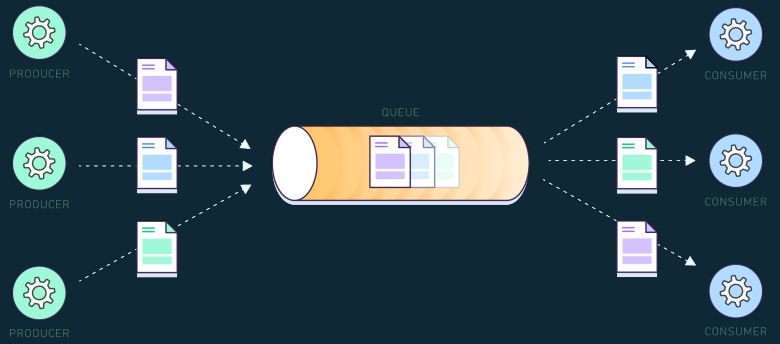
Amazon SQS

What is Amazon SQS?

Simple, flexible, fully managed message queuing service for reliably and continuously exchanging any volume of messages from anywhere



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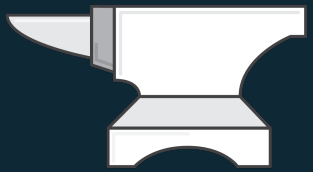
Why Amazon SQS?

Decouple applications to scale in the cloud

Simple

Fully managed and easy to use



Always Durable

Message stored across multiple AZ

Highly Available

Designed for extreme availability

Continuous Scaling

Automatic scaling with unlimited throughput

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Amazon SQS Capabilities

- Messages are encrypted at rest (KMS) and in flight (HTTPS/TLS)
- Integrated with other AWS services (e.g. Lambda as a destination)
- Instant message delivery with long polling
- Message payloads up to 256 KB (2 GB using S3)
- Simplified troubleshooting with a Dead Letter Queue
- Easy monitoring with CloudWatch, with alarming
- Message batching delivers even higher throughput and reduced cost
- Support standard and ordered queues

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SQS Use Cases

Increase reliability and scale:

A simple and reliable way for customers to decouple and connect components (microservices) together using queues (e.g. BBC video factory).

Deliver better website experience:

Improve performance by off-loading front-end from back-end system. E.g banking, immediate user response, with payment processed in background.

Cost-effective, timely work:

Place work on single queue. Scale workers based on workload, and latency requirements. Control cost and speed of work. E.g. video transcoding.

Handle bursty workloads:

Quickly scale to take on incoming work without impacting users or calling service. Example, handing bursts of shopping orders.

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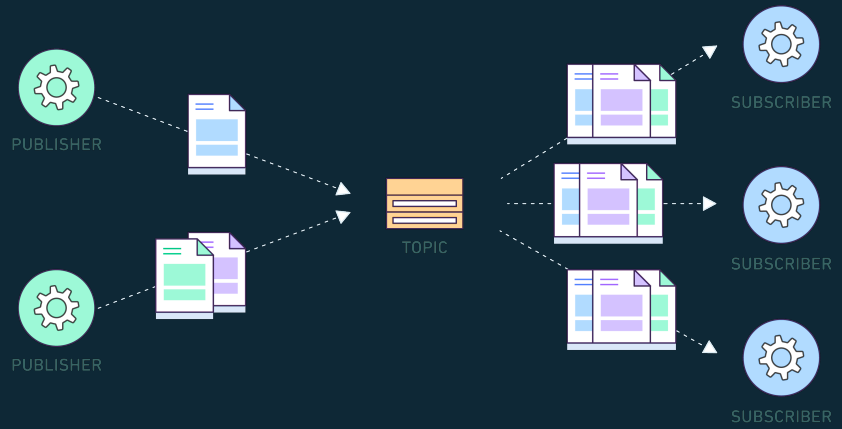
Amazon SNS

What is Amazon SNS?

Simple, flexible, fully managed publish/subscribe messaging and push notification service for high throughput, highly reliable message delivery

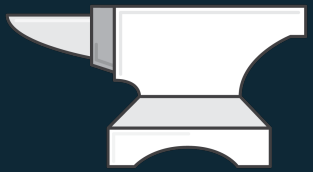


Why Amazon SNS?

Push messages to enable event-driven architecture

Simple

Fully managed and easy to use



Always Durable

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Amazon SNS Capabilities

- Flexible message delivery across multiple transports
- Simplify development with filtered message delivery
- Support for PrivateLink to use SNS inside customer VPC
- Messages are encrypted in flight with HTTPS/TLS
- Deep integration with over 30 AWS services (source and destination)
- Retry policy ensures message delivery (customizable for HTTP)
- Easy monitoring with CloudWatch, with alarming
- Failure notifications

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Amazon SNS Use Cases

Notify multiple applications:

Publish events to topic. Multiple queues or Lambda functions can subscribe to take actions. Filtering can be used to simplify the logic.

Replicate data across regions:

Fan-out and publish data to multiple regions. Data can be kept consistent and replicated across regions to support disaster recovery.

Invoke multiple steps in work flows:

Relay steps between multiple components, microservices or applications. Subscribers simultaneously process steps.

Trigger serverless actions:

Notify Lambda functions of an event. For example, when a document arrives in an S3 bucket, SNS can notify a Lambda to convert it.

Trigger serverless actions:

Amazon MQ

What is Amazon MQ?

Amazon MQ is a managed message broker service for Apache ActiveMQ that makes it easy to set up and operate message brokers in the cloud

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Why Amazon MQ?

Migrate applications to the cloud without re-writing code

Simple

Fully managed eliminating operational overhead

Durable

Message stored across multiple AZs

Highly Available

Easily implement multi-AZ availability

Feature Rich

Easily migrate existing patterns

Low Latency

Deliver time-critical messages

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Why Amazon MQ?

Accelerates application migration to leverage AWS services, without modification of other connected systems

Enables hybrid architectures to integrate on-prem systems with AWS solutions

Provides a **fully featured** managed message broke for **low-latency messaging**

Reduces operational overhead including provisioning, updates, monitoring, maintenance, security, managing durability and availability and troubleshooting

Compatible with industry-standard messaging APIs and protocols enabling you to **connect to other systems and applications without rewriting code**

Reduce costs and pay by the hour without **expensive annual licenses**

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Amazon MQ Capabilities

- Setup a message broker in minutes
- Fully managed implementation of Apache ActiveMQ
- Highly durable (multi-AZ store) and highly available (active and standby)
- Messages encrypted at rest (service managed) and in flight (TLS)
- Message delivery across multiple protocols and transports (JMS, AMQP, MQTT, NMS, STOMP, WebSockets)
- Supports customer VPC endpoints and public endpoints
- Easy monitoring with CloudWatch
- Unlimited message size and retention
- Rich features (queues and topics, transient/persistent, distribute transactions, filtering, scheduling, virtual destinations, request/reply)

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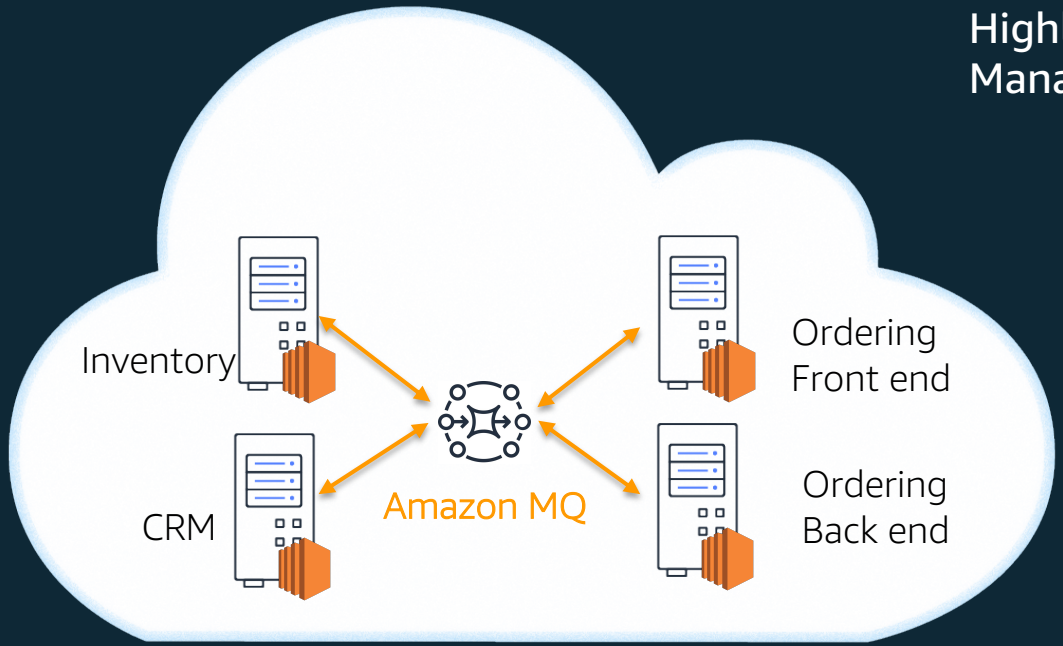
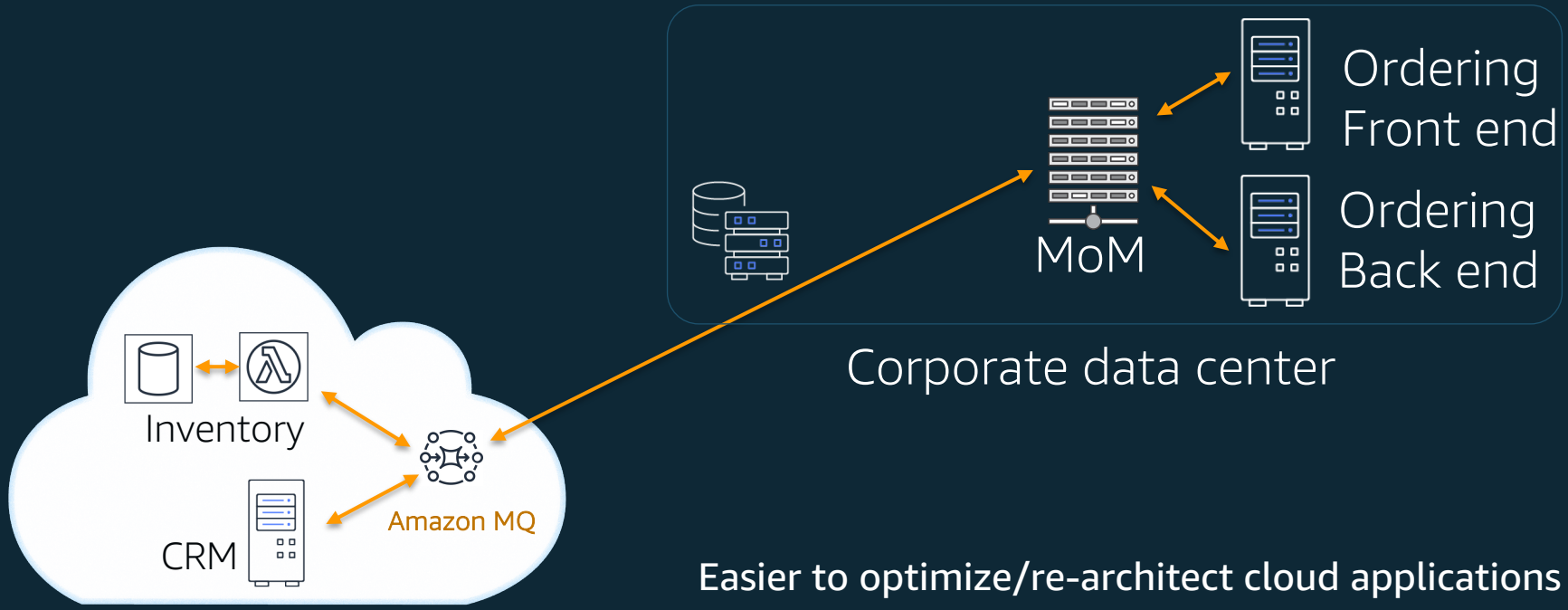
Amazon MQ use cases – Easily eliminate overhead and costly licenses

No more annual licenses
Highly available
Managed service



Amazon MQ use cases - Migrate applications and re-factor faster



Easier to optimize/re-architect cloud applications

Amazon MQ Examples

Large manufacturing enterprise:
Enterprise customer lift-and-shifted infrastructure to AWS. They use commercial message-oriented-middleware and have a $500K license renewal this year. They want to move to a managed service to save cost and lower overhead, and do not have the resources to re-write all their applications.

Medium sized Publishing company:
Enterprise customer is just beginning their migration and wants to move their first three applications to the cloud but all their applications are connected through their on-prem commercial broker. They need a standards-based message broker to bridge between their on-prem and cloud applications.

Large Fortune 500 company with Global IT teams:
Operates a self-managed messaging platform that application team use with standards-based APIs (JMS). They want to lower operational overhead by replacing the existing system with a managed service, while maintaining interface compatibility so they don't have to re-write any applications.

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When should You use Amazon MQ vs SQS/SNS?

SQS & SNS

- For born-in-the-cloud applications
- Simple
- Unlimited throughput
- Fully managed

Amazon MQ Service

- For application migration
- API-compatible
- Feature-rich
- Instance based scale
- Managed infrastructure