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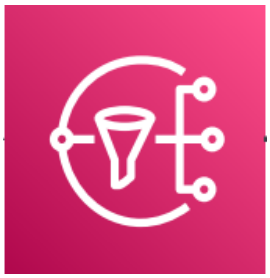
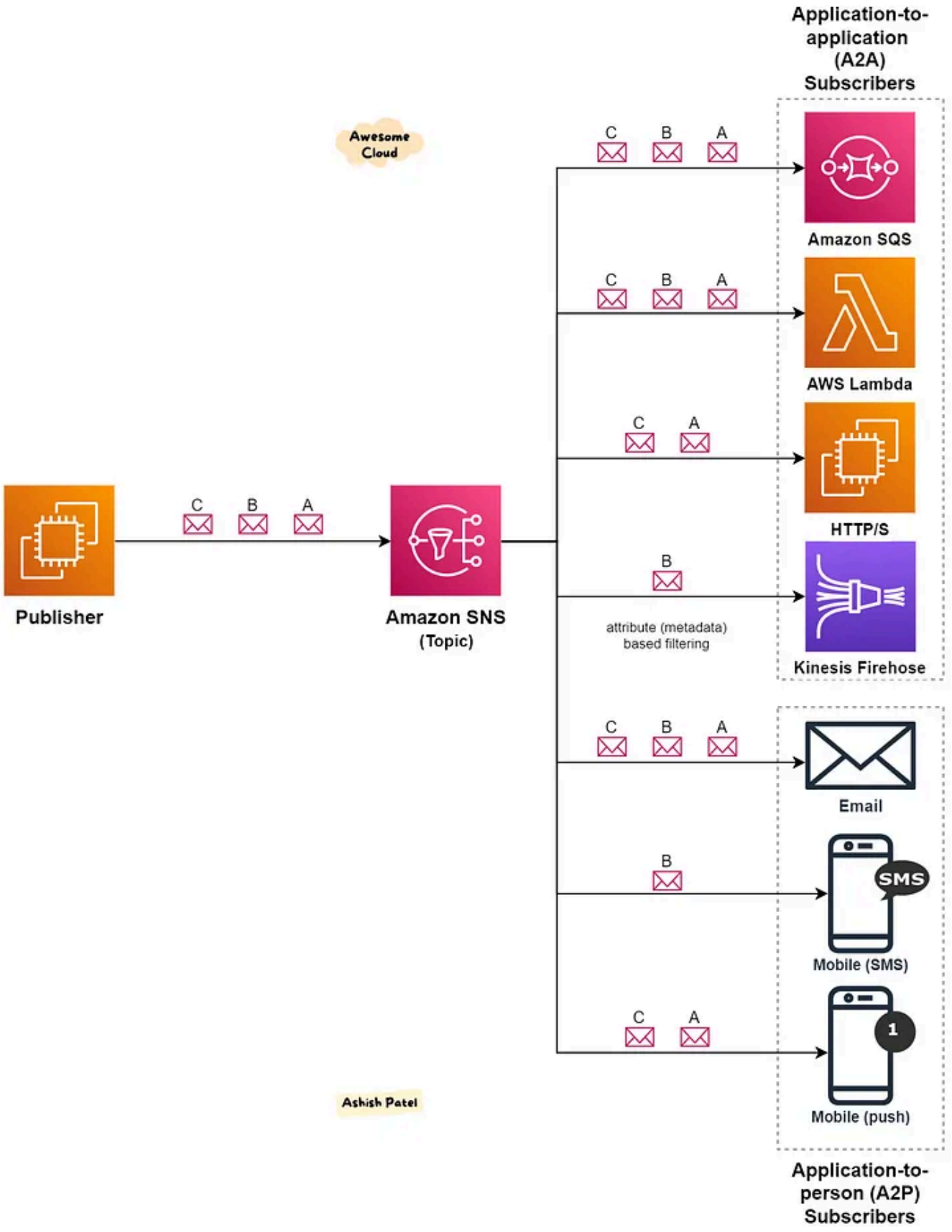
AWS SNS



Amazon Simple Notification Service (SNS) is a fully managed messaging service used for sending notifications to distributed systems, microservices, and end users. It enables high-throughput, push-based messaging between applications and users via various protocols.



Key Features of AWS SNS

1. **Pub/Sub Messaging Model**
   - SNS follows the publisher-subscriber model where messages are sent to a topic and delivered to multiple subscribers.
2. **Multiple Protocols Support**
   - Supports various delivery protocols:

        - **Amazon SQS** – Fan-out messages to multiple SQS queues.
        - **AWS Lambda** – Trigger AWS Lambda functions asynchronously.
        - **Email** – Send email notifications.
        - **SMS** – Send text messages to mobile users.
        - **HTTP/HTTPS** – Push messages to webhooks and APIs.
3. **Message Filtering**
    - Allows subscribers to filter messages and receive only relevant notifications.
4. **Durability & Scalability**
    - Automatically scales to handle high volumes of messages.
5. **Security & Access Control**
    - Integration with **AWS IAM** for permission control.
    - **Message encryption** using AWS KMS.
    - **VPC Endpoints** for secure private communication.
6. **FIFO Topics (New Feature)**
    - Ensures ordered message delivery with deduplication.

Use Cases

- **Application Alerts & Monitoring** – Notify teams about system failures, security breaches, or anomalies.
- **Decoupling Microservices** – Enables asynchronous communication between microservices.
- **Fan-out Messaging** – Distribute a message to multiple subscribers (e.g., sending logs to multiple SQS queues).
- **User Notifications** – Send emails, SMS, or push notifications to users.

How AWS SNS Works?

1. **Create a Topic**
    - A topic acts as a communication channel.
    - Example: arn:aws:sns:us-east-1:123456789012:MyTopic
2. **Add Subscribers**
    - Subscribe AWS Lambda, SQS, HTTP endpoint, Email, or SMS to the topic.
3. **Publish a Message**
    - Messages are published to the topic, and SNS pushes them to all subscribers.
4. **Subscribers Receive the Message**
    - Each subscriber gets a copy based on the subscription type.

Comparison: AWS SNS vs. AWS SQS

Feature	SNS (Pub/Sub)	SQS (Queue-based)
Message Type	Push-based notifications	Pull-based queue messages
Delivery Mode	One-to-many (Fan-out)	One-to-one or one-to-many
Use Case	Real-time notifications, microservices decoupling	Reliable message processing, delayed processing
Persistence	No message storage	Messages stored until consumed

Best Practices

✔ Use **FIFO Topics** if message order is important.
✔ Implement **dead-letter queues (DLQ)** for failed deliveries.
✔ Use **message filtering** to reduce unnecessary notifications.
✔ Enable **encryption** for sensitive data.
✔ Use **SNS delivery status logging** for debugging failures.