What is the difference between SNS and SQS, and how does topic-based publish/subscribe architecture work in SNS?

1. What is Amazon SNS?
Amazon **Simple Notification Service (SNS)** is a **fully managed messaging service** used for **broadcasting (fan-out)** messages.

- With **SQS**, messages are queued for processing (point-to-point).
- With **SNS**, messages are **pushed to many subscribers at once** (publish/subscribe).

Think of SNS as a **loudspeaker system**: one person speaks (publisher), and everyone in the room (subscribers) hears it immediately.

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2. Difference Between SNS and SQS

Feature	SQS (Queue)	SNS (Notification)
Type	Point-to-point (1:1)	Publish/Subscribe (1:many)
Delivery	Poll-based (consumers pull messages)	Push-based (SNS pushes messages)
Use case	Decouple producer/consumer apps	Broadcast notifications to many systems/users
Example	Order service → Payment service	Order service → Notify Payment + Inventory + Email

👉 **DevOps use case:**

- In a CI/CD pipeline, you might use **SQS** to queue build jobs one by one for a worker.
- You might use **SNS** to send deployment notifications to Slack, email, and monitoring tools **at the same time**.

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3. Topic-Based Publish/Subscribe Architecture in SNS
SNS works on a **topic model**:

- A **topic** is like a channel where publishers send messages.
- **Subscribers** register to the topic to receive updates.
- When a publisher sends a message to the topic, **all subscribers get it simultaneously**.

Example flow (E-commerce use case):

1. You create an SNS topic → OrderPlacedTopic.

2. Subscribers:
    - SQS queue (for order processing service)
    - Lambda function (to update inventory)
    - Email endpoint (to notify customer)
    - HTTP endpoint (to notify shipping partner)
3. When a new order is placed → Publisher (Order service) sends a message → SNS **fans out** to all subscribers instantly.

✅ **Summary:**

- **SQS** = decouple apps (queue, worker pulls messages).
- **SNS** = broadcast messages to many endpoints (push to subscribers).
- Together, they're often used in **fan-out patterns** (SNS → multiple SQS queues).

Amazon Simple Notification Service (SNS) is primarily used for:
a) Storing data in the cloud
b) Broadcasting messages to multiple subscribers
c) Processing messages in a queue
d) Monitoring AWS resources
✅ **Answer:** b) Broadcasting messages to multiple subscribers

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Which statement best describes the difference between SNS and SQS?
a) SNS is point-to-point, SQS is publish/subscribe
b) SNS is push-based, SQS is poll-based
c) SQS is used for broadcasting messages, SNS is for queue processing
d) Both SNS and SQS deliver messages only via email
✅ **Answer:** b) SNS is push-based, SQS is poll-based

In a CI/CD pipeline, how would you typically use **SQS**?
a) To notify multiple monitoring tools at once
b) To queue build jobs for workers to process one by one
c) To send deployment updates to Slack
d) To broadcast alerts to customers
✅ **Answer:** b) To queue build jobs for workers to process one by one

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In a CI/CD pipeline, how would you typically use **SNS**?
a) To decouple build and deployment stages
b) To store build artifacts
c) To broadcast deployment notifications to Slack, email, and monitoring tools
d) To process queued jobs sequentially
✅ **Answer:** c) To broadcast deployment notifications to Slack, email, and monitoring tools

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In SNS, what is a **topic**?
a) A queue where only one consumer can read messages
b) A channel where publishers send messages and subscribers receive them

c) A storage bucket for logs
d) An EC2 instance that hosts subscribers
✅ **Answer:** b) A channel where publishers send messages and subscribers receive them

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Which of the following is **NOT** a valid subscriber type for an SNS topic?
a) Lambda function
b) SQS queue
c) Email endpoint
d) Amazon S3 bucket
✅ **Answer:** d) Amazon S3 bucket
