




Module 11



The architectural need

Your architecture now supports hundreds of thousands of users, but if one part fails, the whole application fails. You need to remove dependencies.

Module Overview

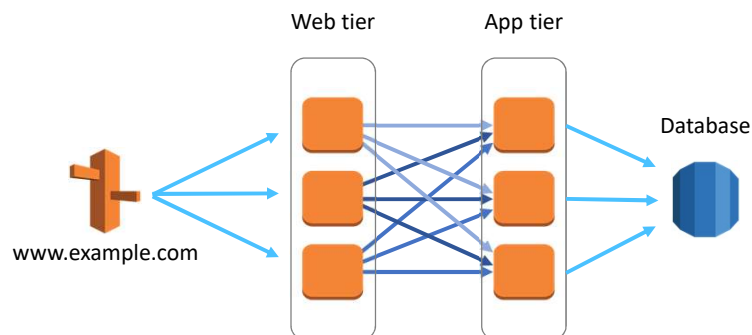
- Decoupled Architecture
- Using Amazon SQS and Amazon SNS to create decoupled architectures

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Decoupling Your Architecture

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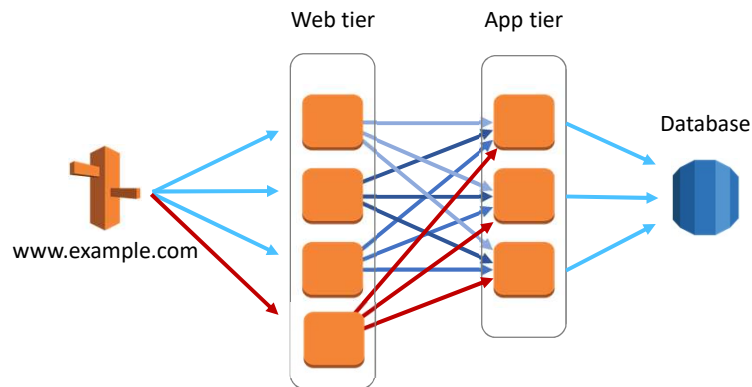
What Does “Tightly Coupled” Mean?



Components are **strongly tied** to each other.

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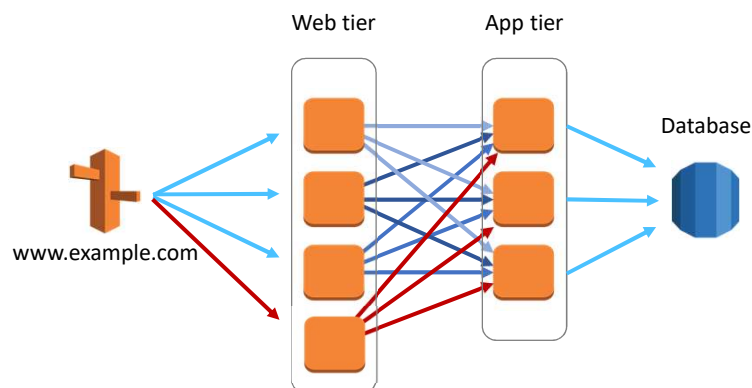
What Does “Tightly Coupled” Mean?



Adding resources **greatly increases complexity.**

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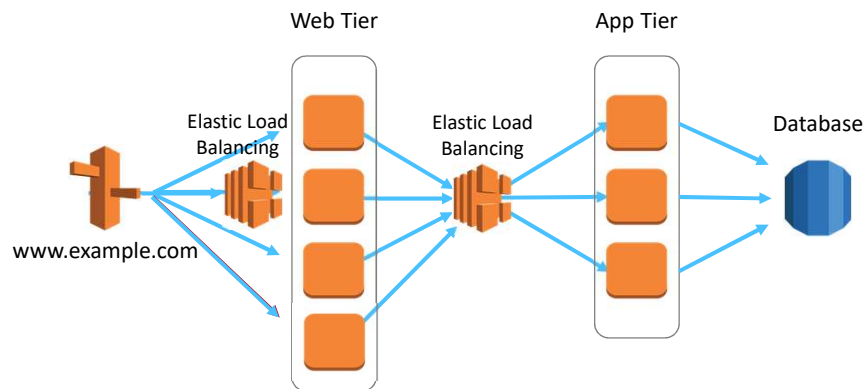
What Does “Tightly Coupled” Mean?



This needs to be **decoupled.**

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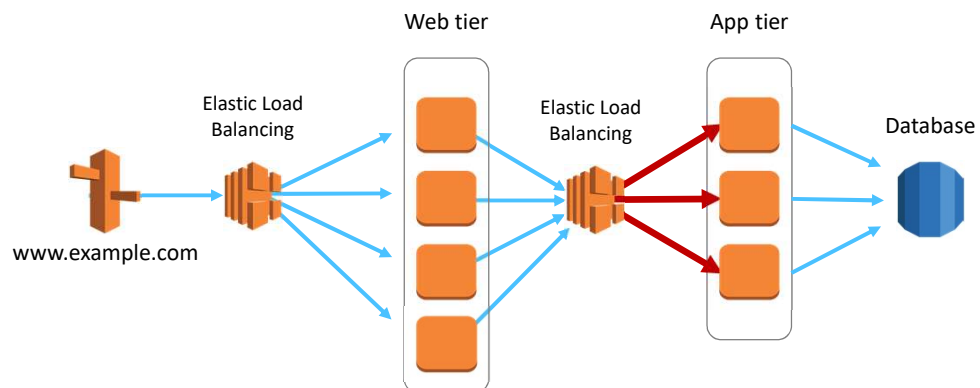
Loosely Coupled



This needs to be **decoupled**.

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What If The App Servers Become Overloaded?



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Decoupling with Amazon SQS

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Amazon Simple Queue Service (Amazon SQS)



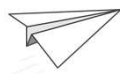
Amazon
SQS



Fully managed message queueing service



Messages are stored until they are
processed and deleted



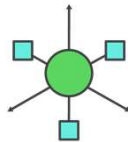
Acts as a buffer between senders and
receivers

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Achieving Loose Coupling with Amazon SQS



Using SQS queues, you can:



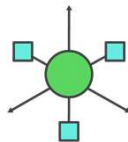
Use **asynchronous processing** to get your responses from each step quickly

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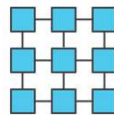
Achieving Loose Coupling with Amazon SQS



Using SQS queues, you can:



Use **asynchronous processing** to get your responses from each step quickly



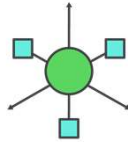
Handle **performance and service requirements** by increasing the number of job instances

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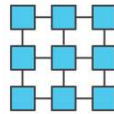
Achieving Loose Coupling with Amazon SQS



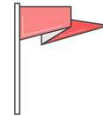
Using SQS queues, you can:



Use **asynchronous processing** to get your responses from each step quickly



Handle **performance and service requirements** by increasing the number of job instances



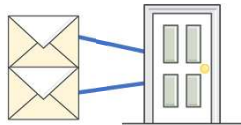
Easily **recover from failed steps** since messages will remain in the queue

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Queue Types

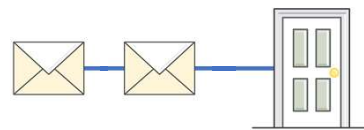


Standard queues



At-least-once delivery

FIFO queues



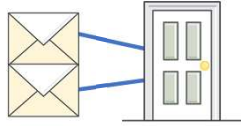
Messages are **processed exactly once**

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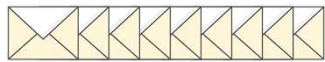
Queue Types



Standard queues

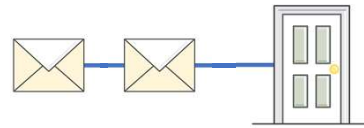


At-least-once delivery

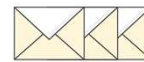


Nearly unlimited number of transactions per second (TPS) per API action.

FIFO queues



Messages are processed exactly once



Support up to 300 messages per second

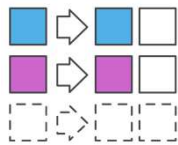
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14

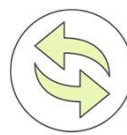
SQS General Use Cases



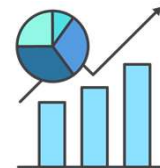
Work queues



Buffer batch operations



Request offloading



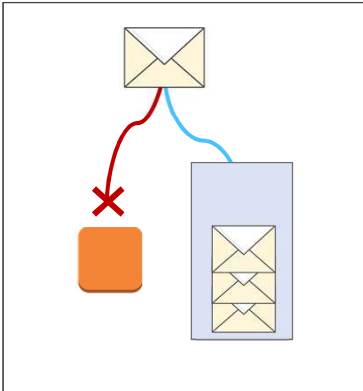
Scaling trigger

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Amazon SQS Features



Dead letter queue support

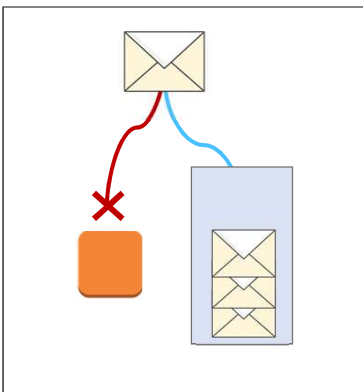


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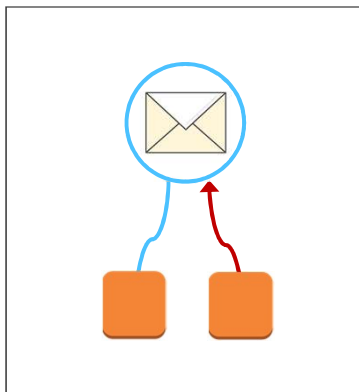
Amazon SQS Features



Dead letter queue support



Visibility timeout

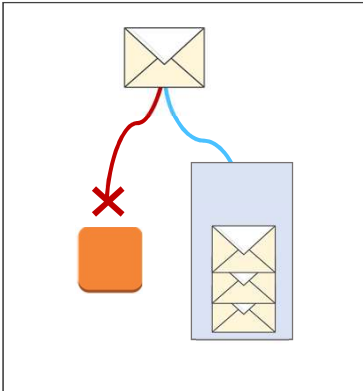


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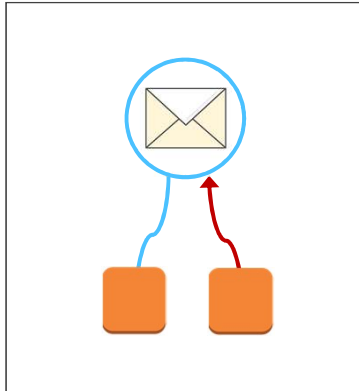
Amazon SQS Features



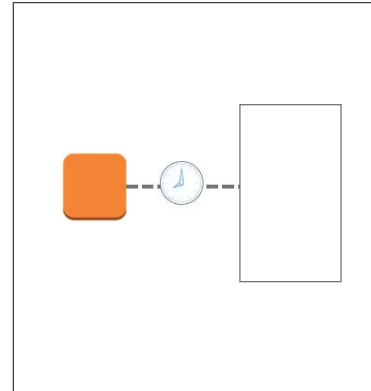
Dead letter queue support



Visibility timeout

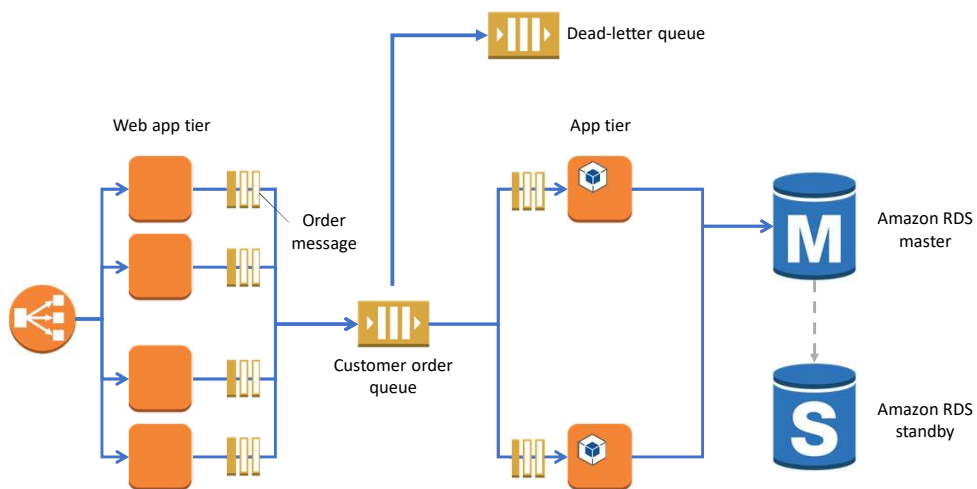


Long polling



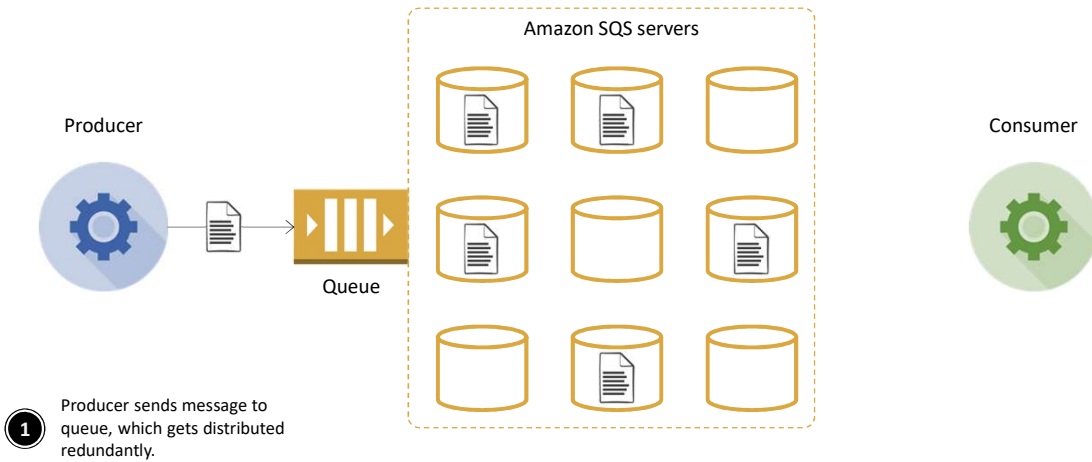
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Amazon SQS Example



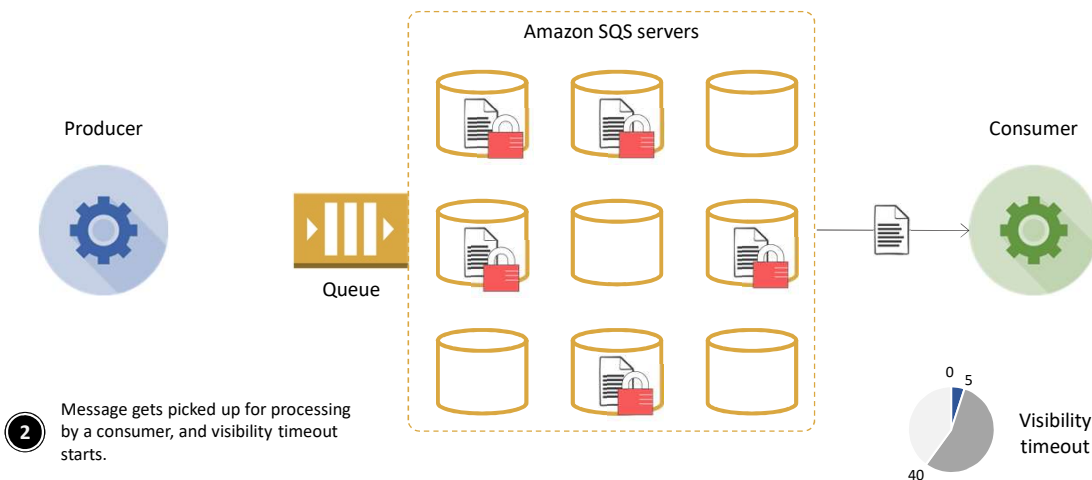
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Amazon SQS Message Lifecycle



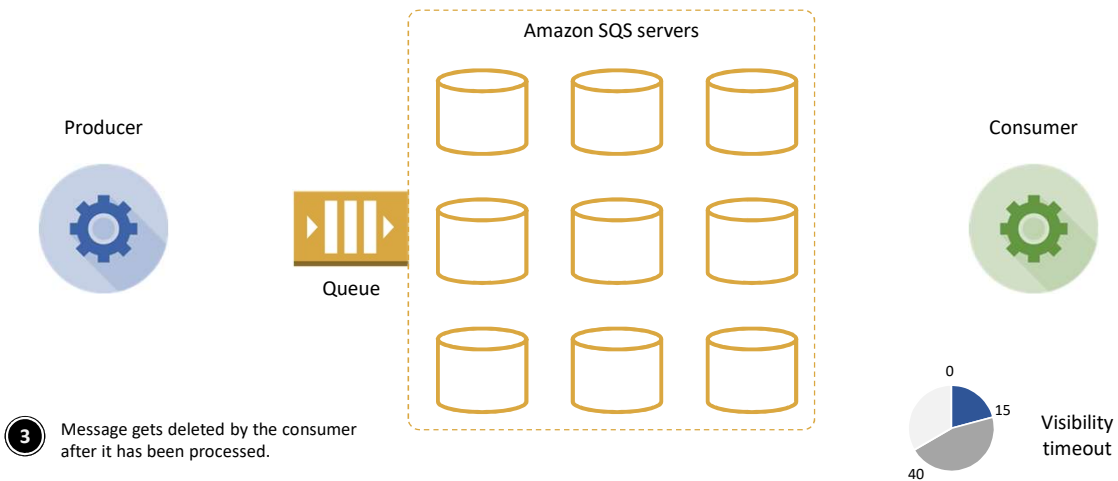
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Amazon SQS Message Lifecycle



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Amazon SQS Message Lifecycle



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Messaging Use Cases



- ✓ Service-to-service communication
- ✓ Asynchronous work items
- ✓ State change notifications

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Messaging Use Cases



Service-to-service communication



Selecting specific messages



Asynchronous work items



Large messages



State change notifications

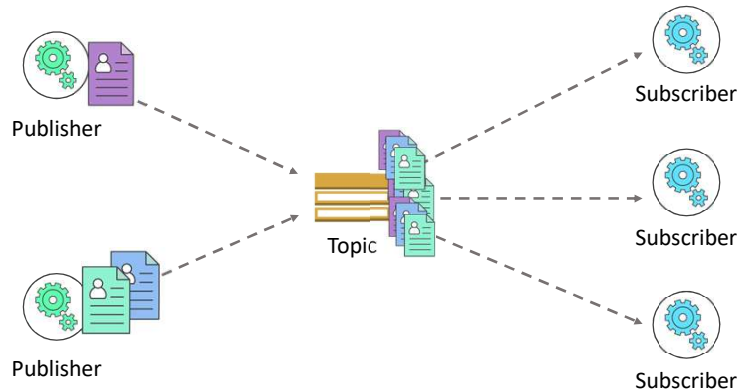
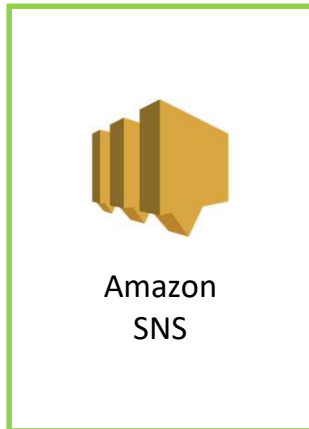
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Decoupling with Amazon SNS

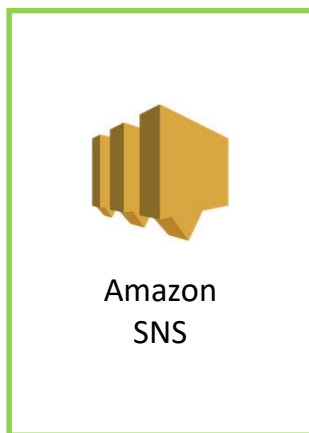
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Amazon Simple Notification Service (Amazon SNS)



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Amazon SNS Subscription Types



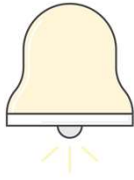
- Email
- HTTP/HTTPS
- Short Message Service (SMS) clients
- Amazon SQS queues
- AWS Lambda functions

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General Use Cases for Amazon SNS



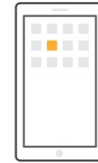
Application and system alerts



Push email and text messaging



Mobile push notifications



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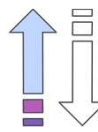
Characteristics of Amazon SNS



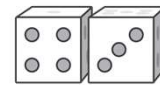
Single published message



No recall options



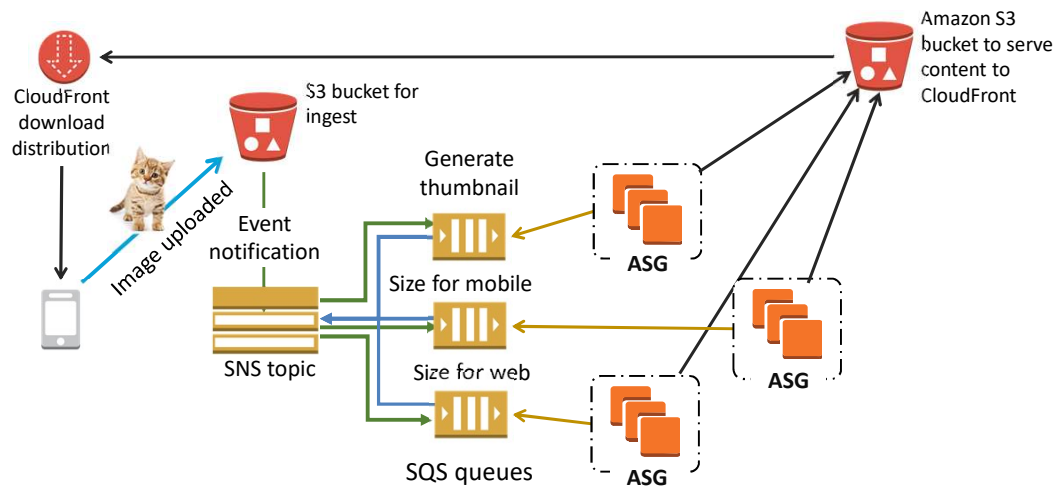
HTTP/HTTPS retry



Order and delivery not guaranteed

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Achieving Loose Coupling with Amazon SNS and Amazon S3



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How is Amazon SNS Different from Amazon SQS?



	Amazon SNS	Amazon SQS
Message persistence	No	Yes
Delivery mechanism	Push (passive)	Poll (active)
Producer/consumer	Publish/subscribe	Send/receive
Distribution model	One to many	One to one

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