Best Practices for Serverless Queue Processing

Kuba Wojciak
Principal Software Dev Engineer, AWS Messaging

Feb 19th, 2019

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What is serverless?

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What is serverless?

No infrastructure provisioning, no management

Automatic scaling

Pay for value

Highly available and secure

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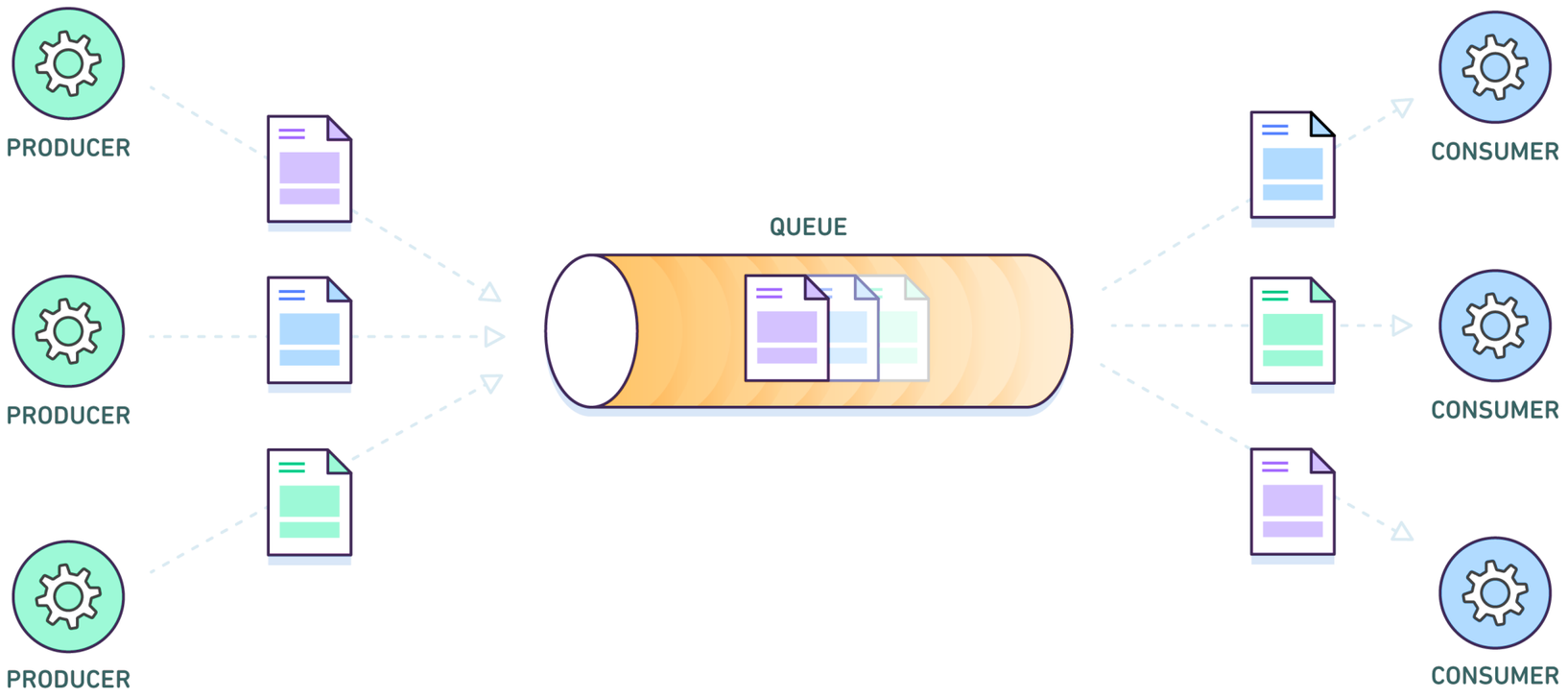
What is Amazon SQS?



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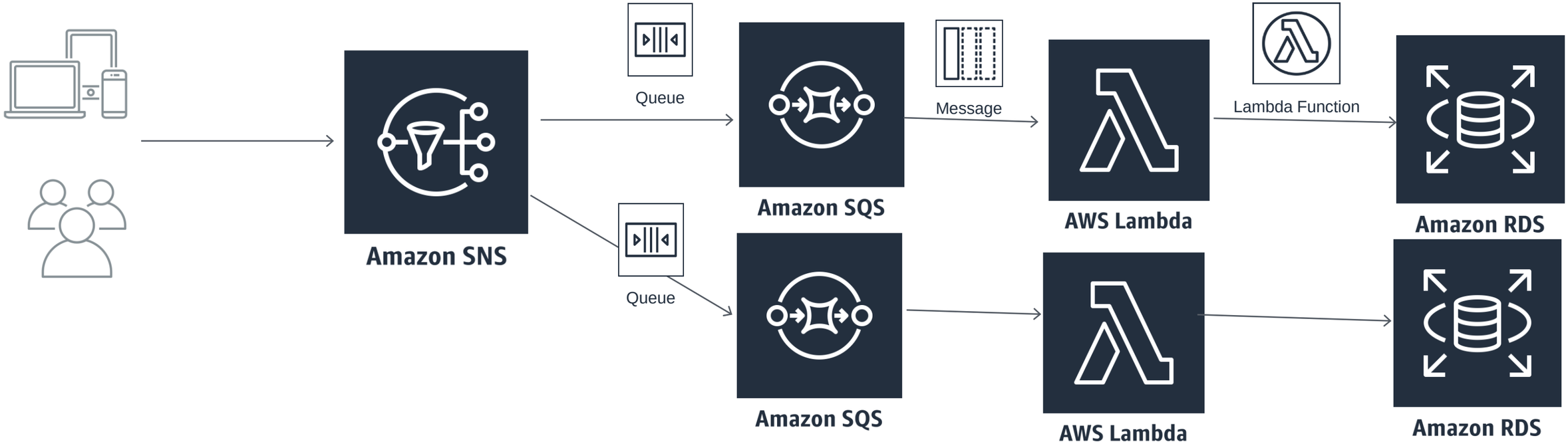
Pipes and filters



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Amazon SQS message producer integrations

Amazon AutoScaling

Amazon Cloudwatch Events

AWS IoT

Amazon Mechanical Turk

Amazon S3

Amazon Simple Notification Service

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Amazon SQS message consumer integrations

AWS Beanstalk workers

AWS Lambda (new!)

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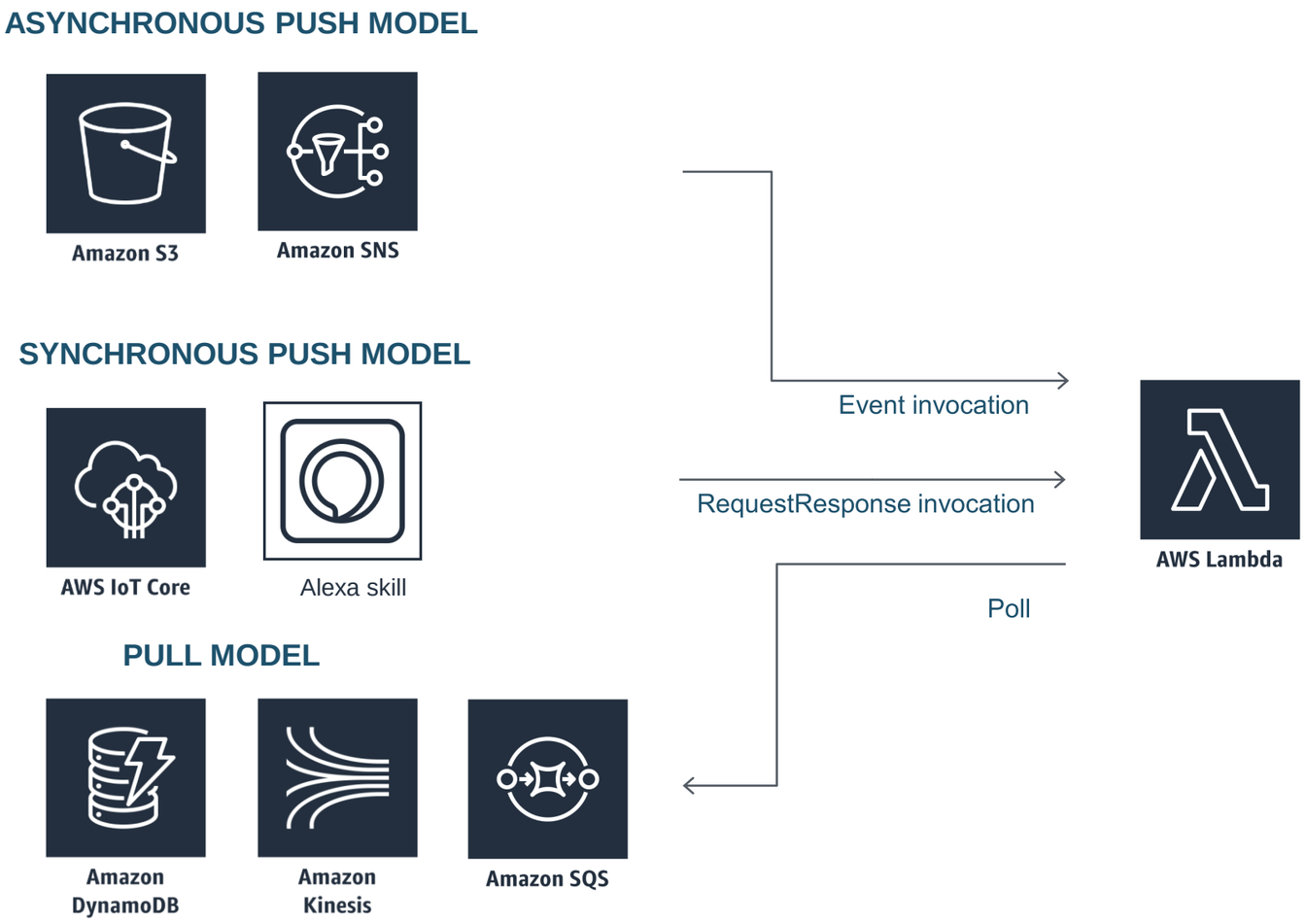
What is AWS Lamda?



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AWS Lambda invocation integrations

Amazon S3
Amazon DynamoDB
Amazon Kinesis Data Streams
Amazon Simple Notification Service
Amazon Simple Email Service
Amazon Simple Queue Service
Amazon Cognito
AWS CloudFormation
Amazon CloudWatch Logs
Amazon CloudWatch Events
AWS CodeCommit
AWS Config
Amazon Alexa
Amazon Lex
Amazon API Gateway
AWS IoT Button
and more…

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Serverless message processing

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Serverless message processing

Queue

Lambda Function

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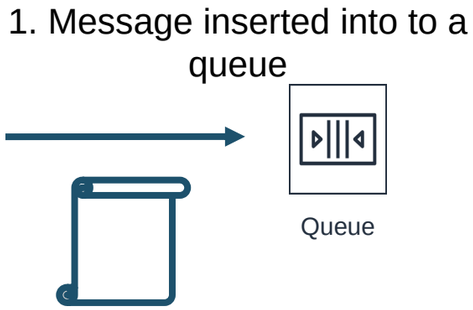
Serverless message processing



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Serverless message processing

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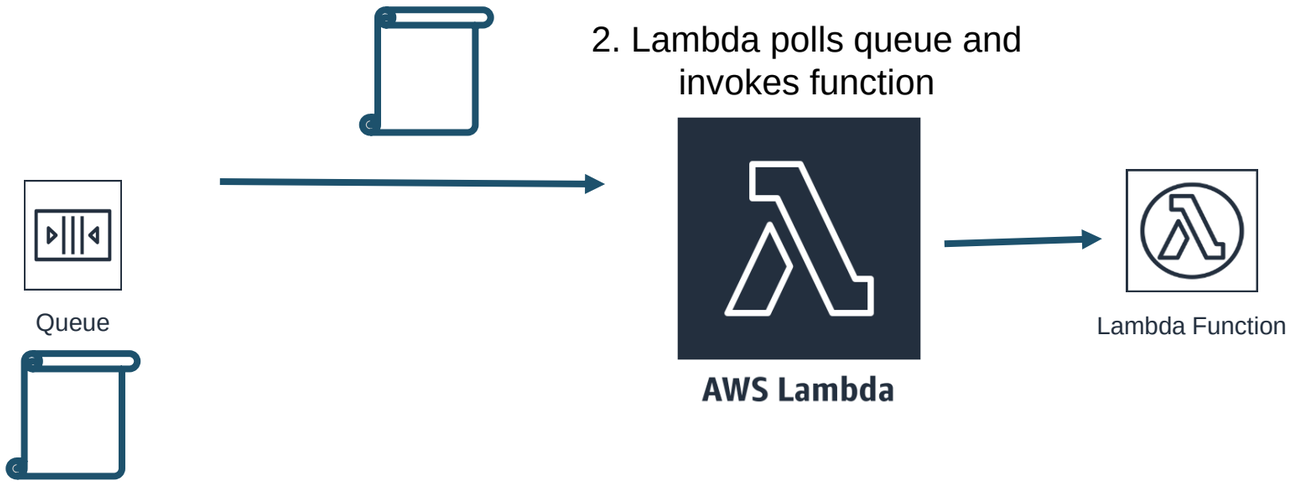
Serverless message processing



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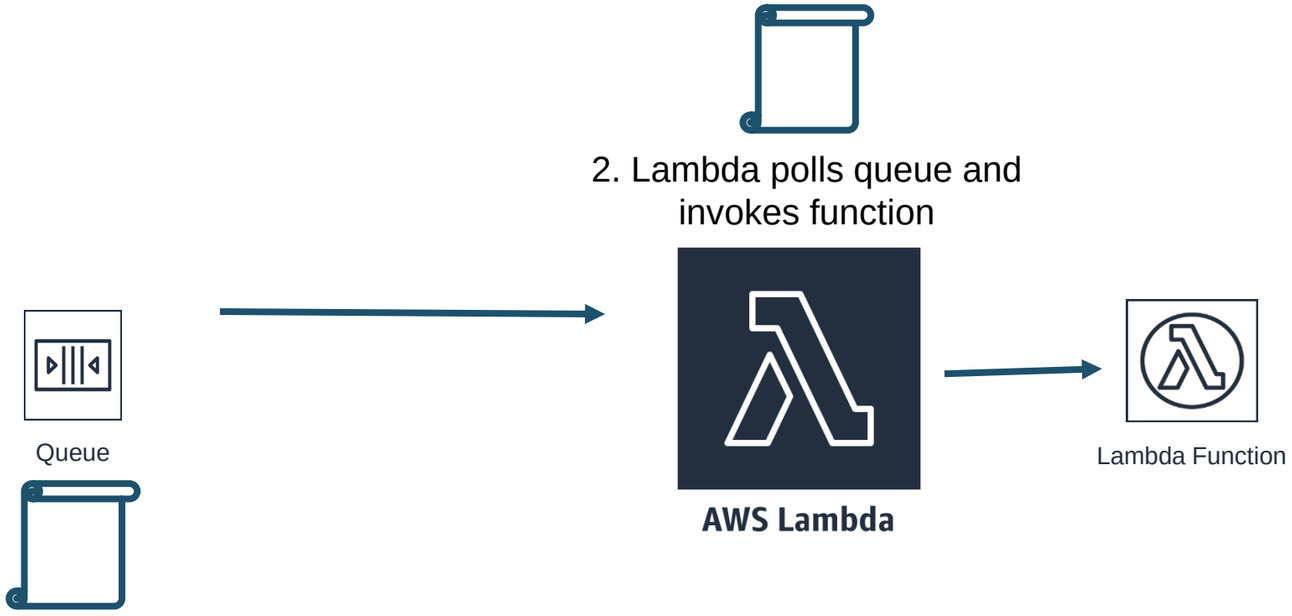
Serverless message processing



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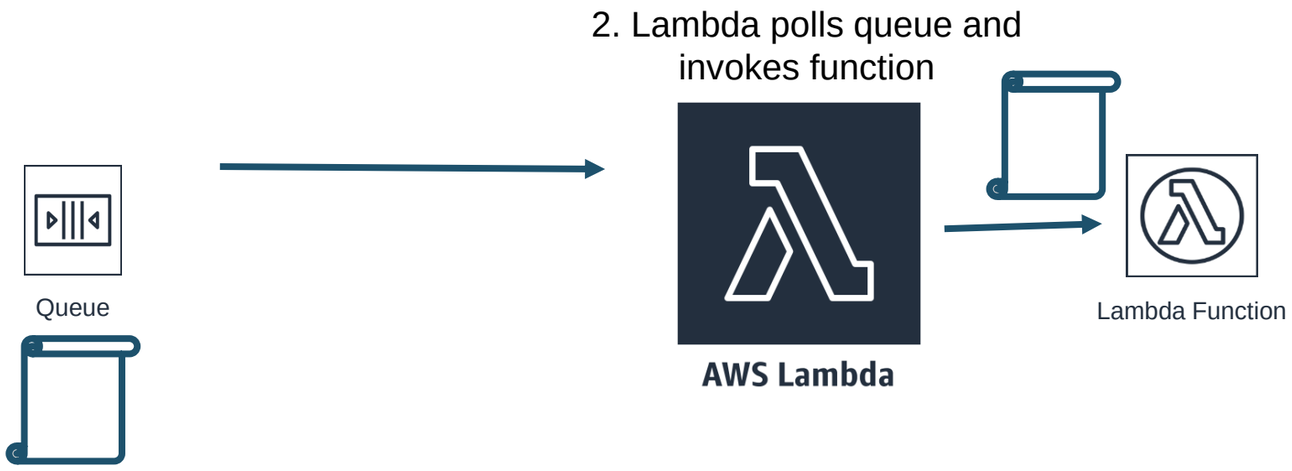
Serverless message processing



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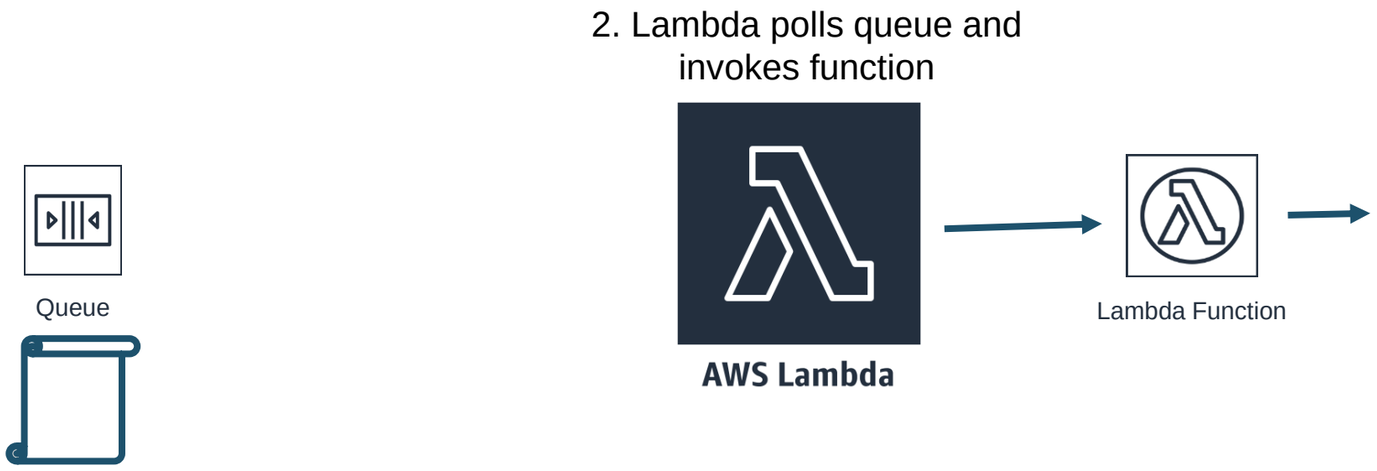
Serverless message processing



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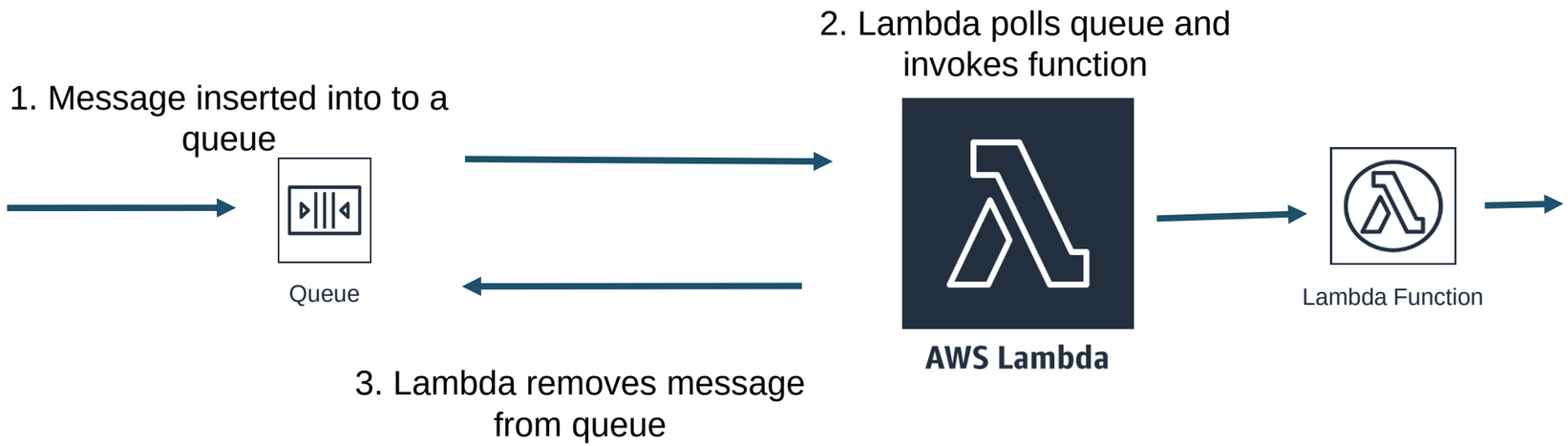

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AWS Lambda async push vs Amazon SQS

AWS Lambda async invoke

- Direct integration

Amazon SQS + AWS Lambda

- Two resources

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AWS Lambda async push vs Amazon SQS

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Amazon SQS + AWS Lambda

- Two resources
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AWS Lambda async push vs Amazon SQS

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- Direct integration
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Amazon SQS + AWS Lambda

- Two resources
- Automatic scaling
- Supports batching

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AWS Lambda async push vs Amazon SQS

AWS Lambda async invoke

- Direct integration
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- Simple DLQ policy

Amazon SQS + AWS Lambda

- Two resources
- Automatic scaling
- Supports batching
- Advanced DLQ policy

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AWS Lambda async push vs Amazon SQS

AWS Lambda async invoke

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- No backlog visibility

Amazon SQS + AWS Lambda

- Two resources
- Automatic scaling
- Supports batching
- Advanced DLQ policy
- Cloudwatch metrics

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AWS Lambda async push vs Amazon SQS

AWS Lambda async invoke

- Direct integration
- Automatic scaling
- No batching
- Simple DLQ policy
- No backlog visibility
- No extra queue features

Amazon SQS + AWS Lambda

- Two resources
- Automatic scaling
- Supports batching
- Advanced DLQ policy
- Cloudwatch metrics
- All SQS features

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AWS Lambda async push vs Amazon SQS

AWS Lambda async invoke

- Direct integration
- Automatic scaling
- No batching
- Simple DLQ policy
- No backlog visibility
- No extra queue features
- No extra cost

Amazon SQS + AWS Lambda

- Two resources
- Automatic scaling
- Supports batching
- Advanced DLQ policy
- Cloudwatch metrics
- All SQS features
- Cost of requests to SQS

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Advanced Amazon SQS features

Advanced DLQ policy

Batching

Delayed messages

Server-side encryption with customer managed key (CMK)

Retention period

Message attributes

Cloudwatch metrics

Purge operation

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Internals

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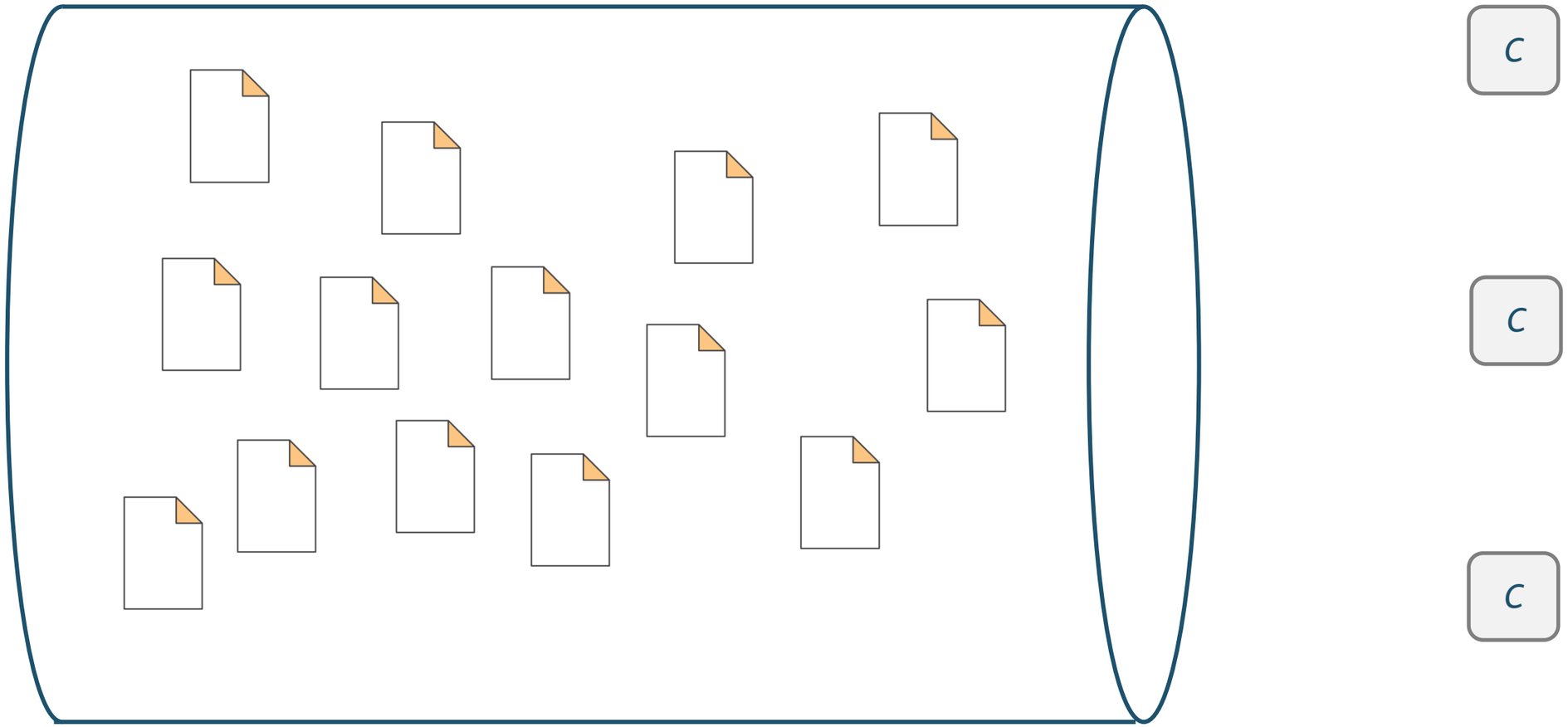
Consuming from Amazon SQS



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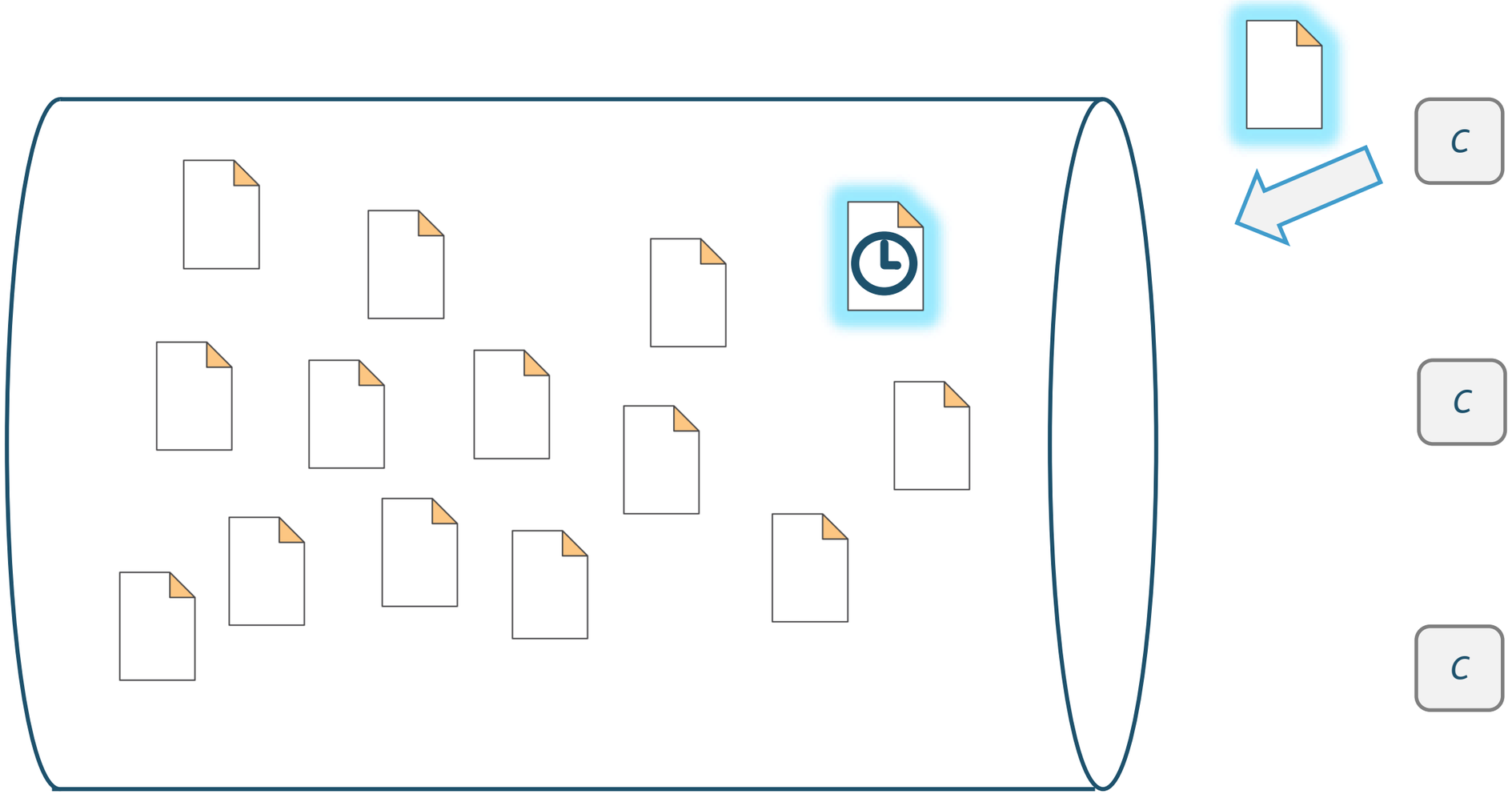

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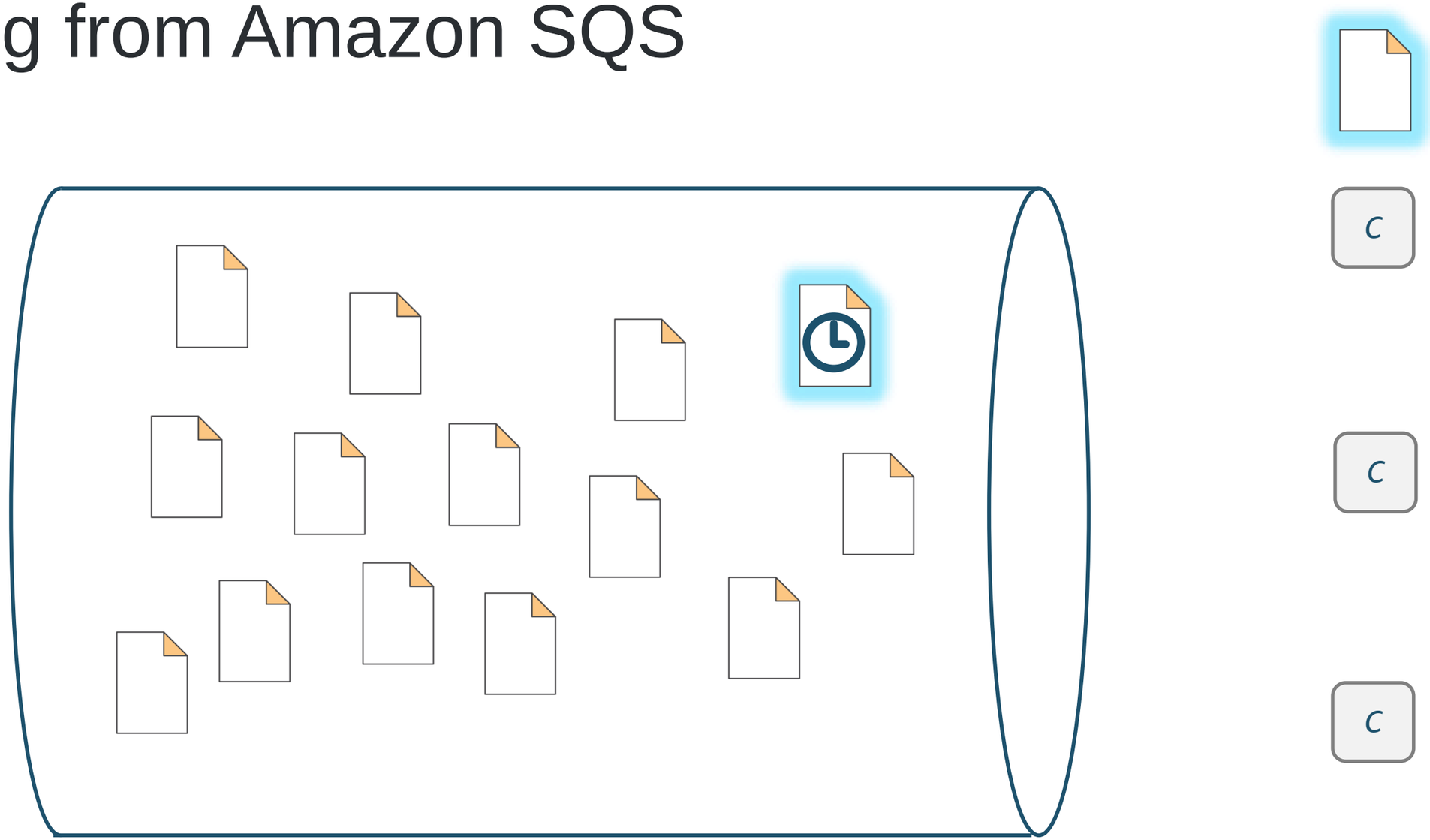
Consuming from Amazon SQS



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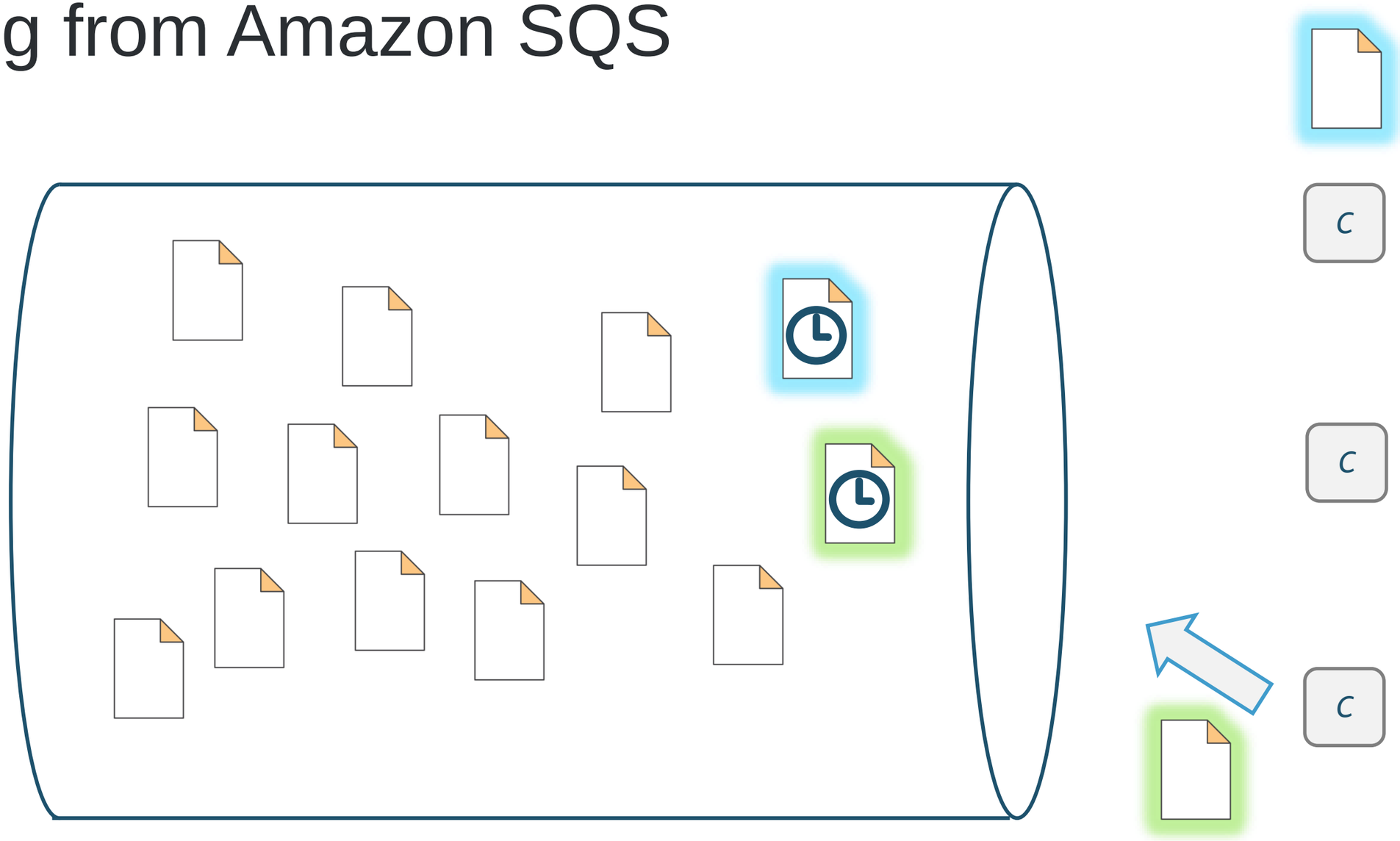
Consuming from Amazon SQS



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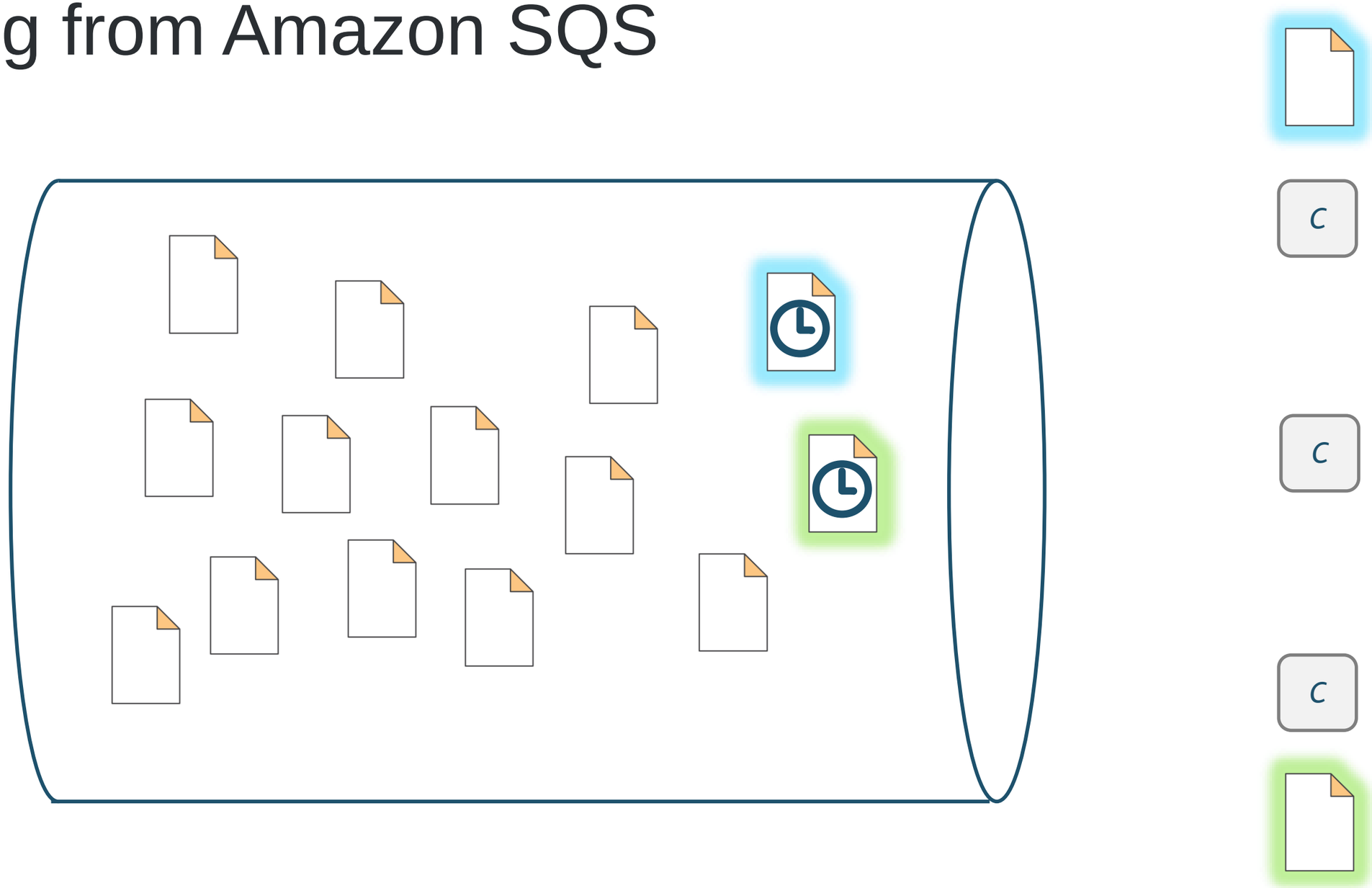
Consuming from Amazon SQS



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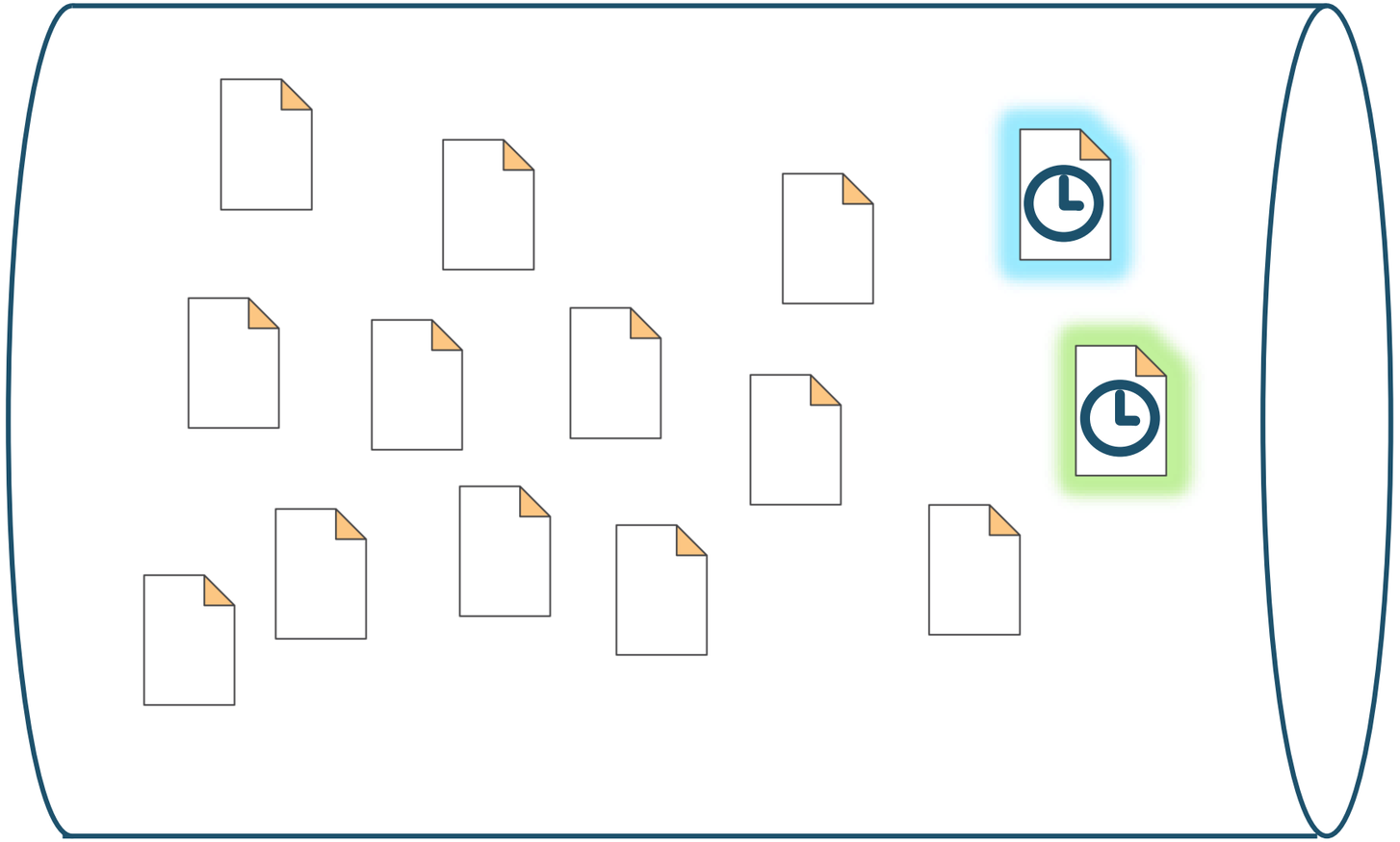
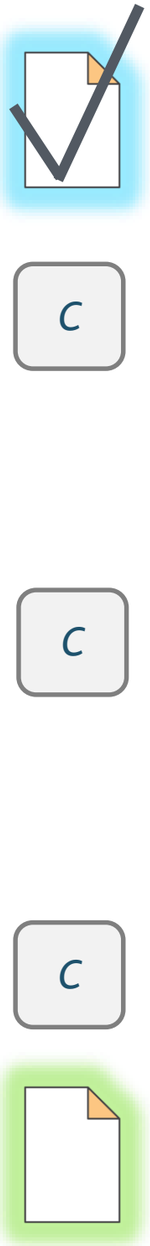
Consuming from Amazon SQS





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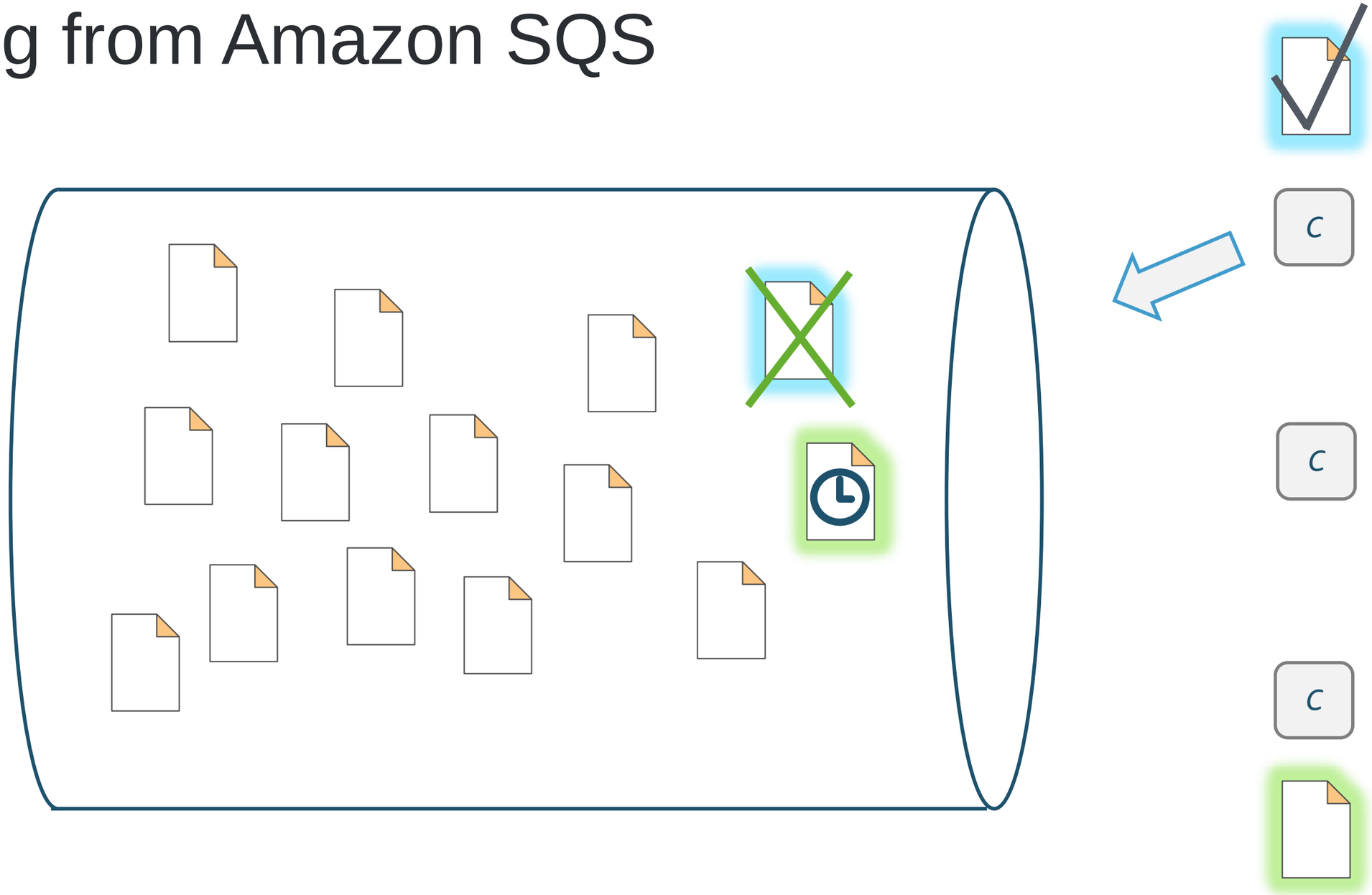
Consuming from Amazon SQS



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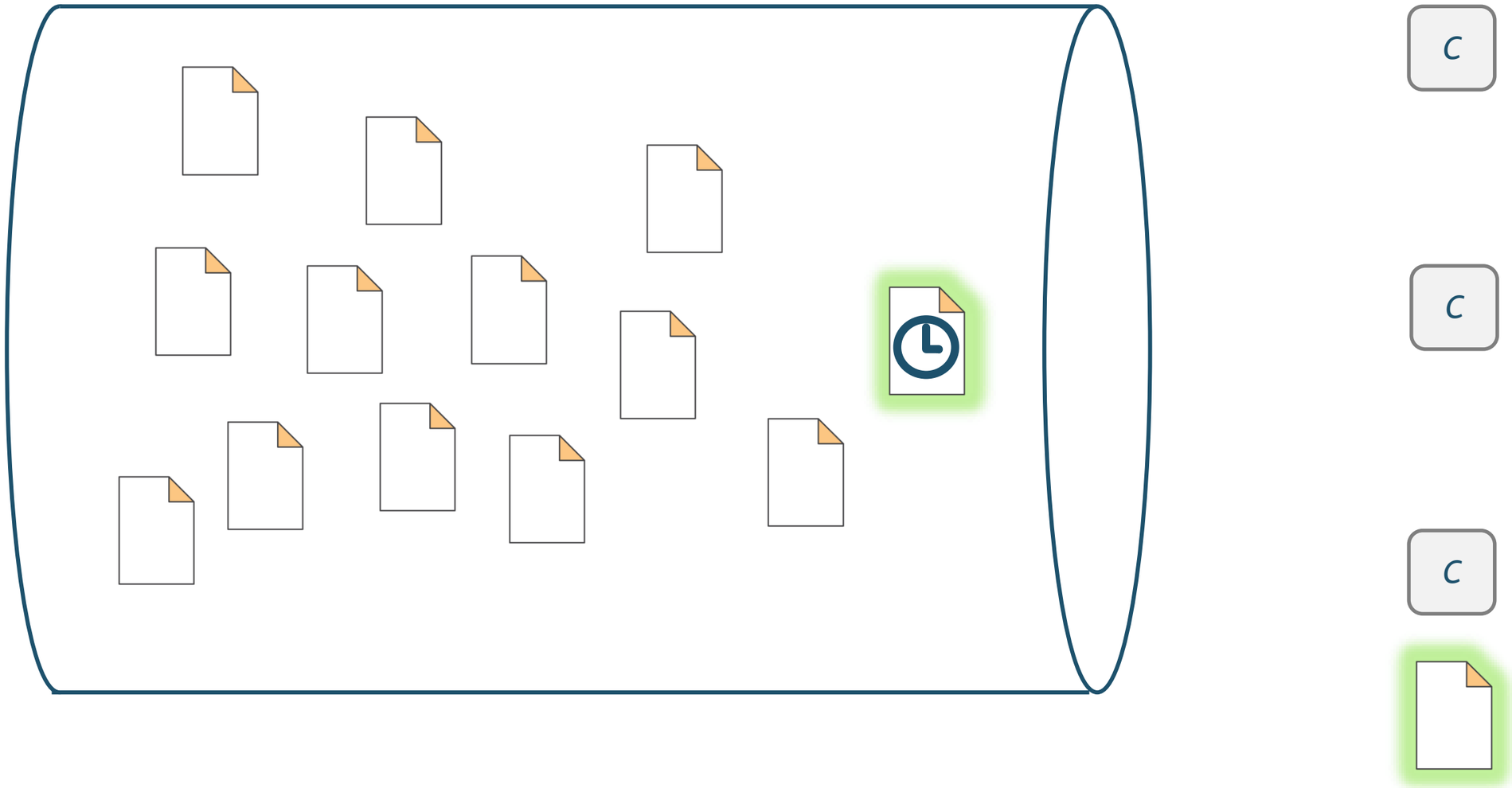
Consuming from Amazon SQS



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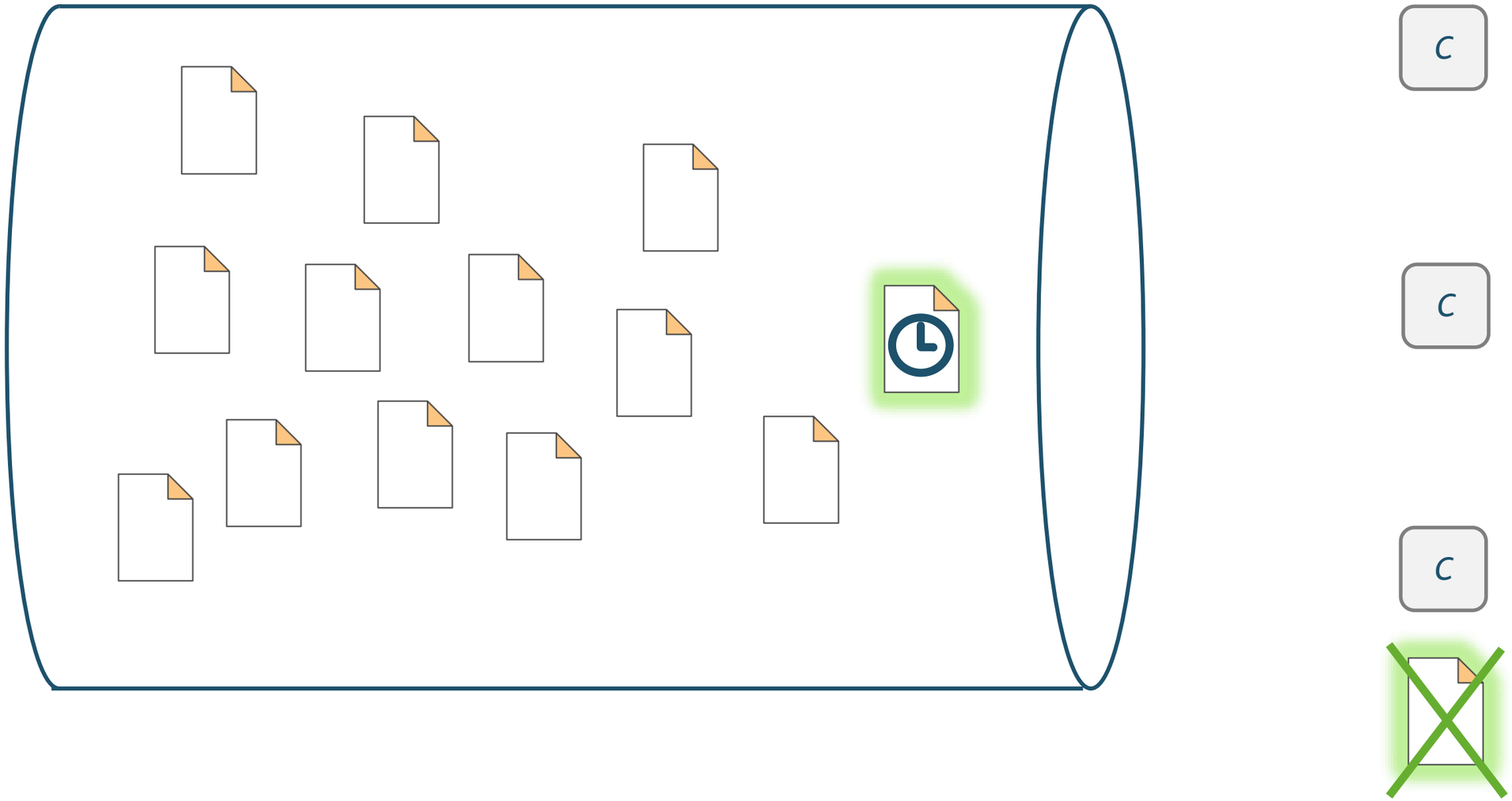
Consuming from Amazon SQS



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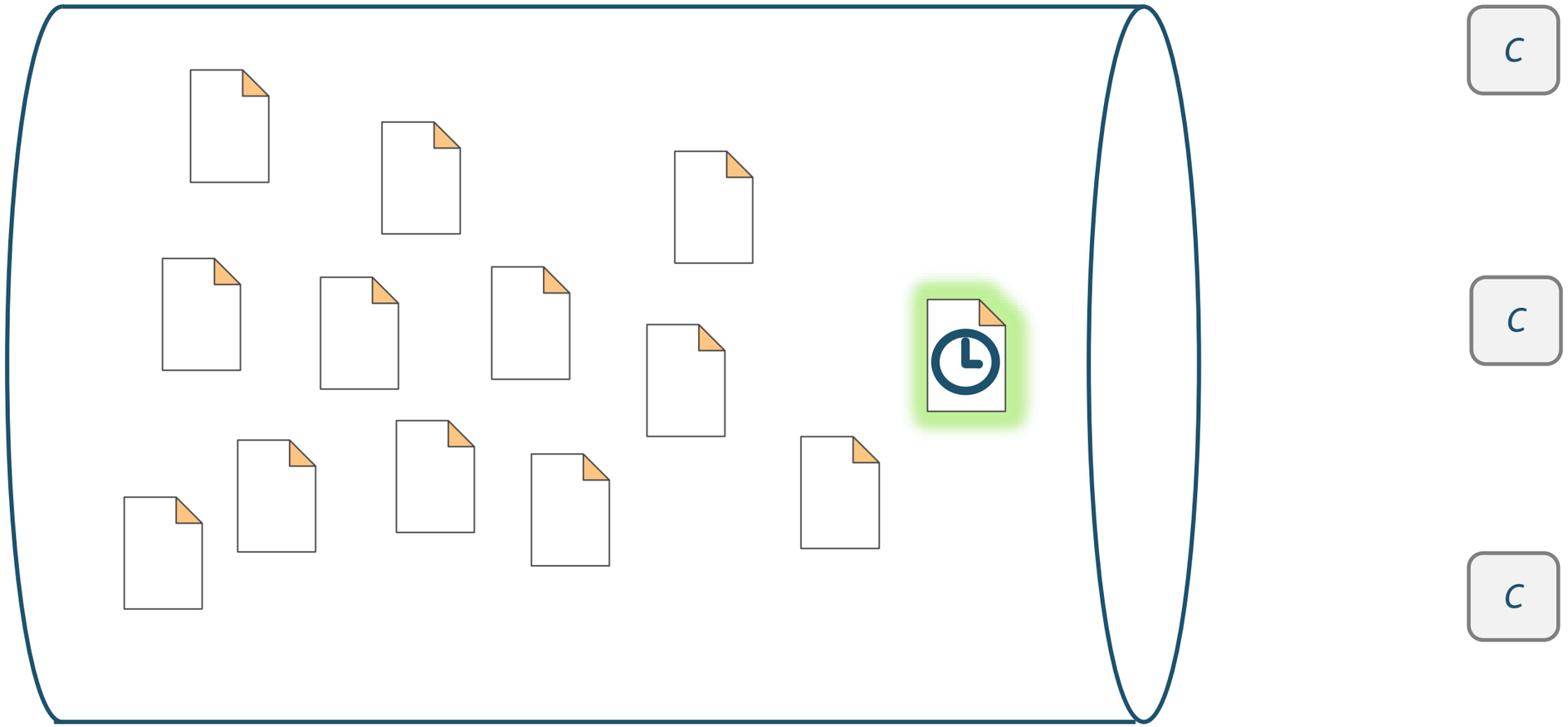

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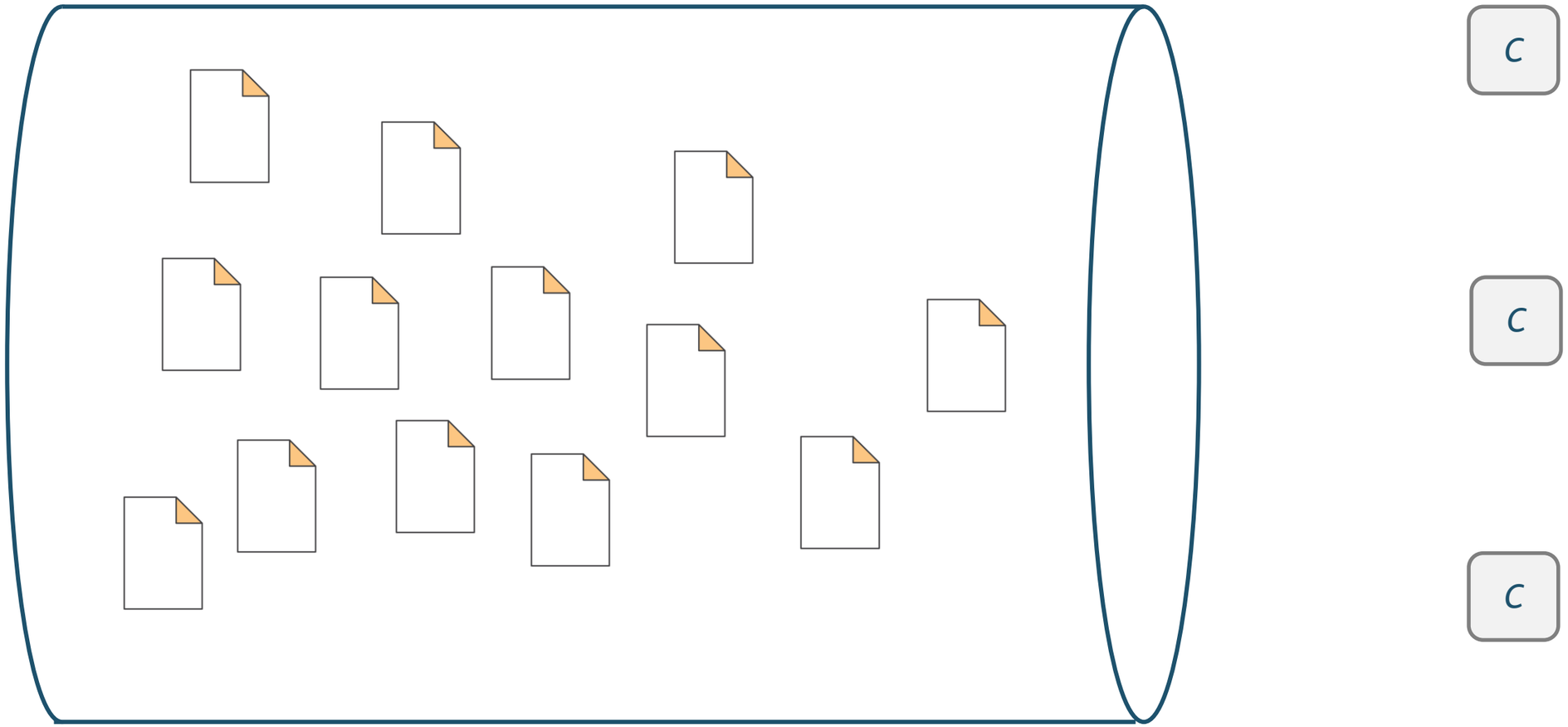
Consuming from Amazon SQS



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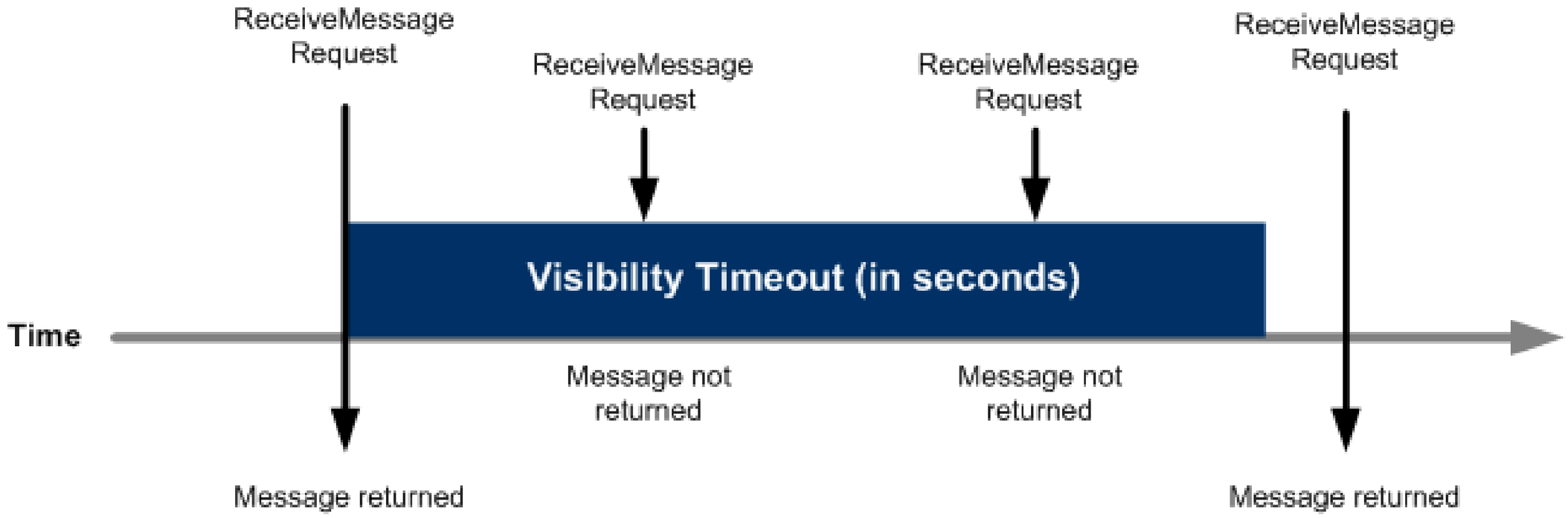
Visibility timeout in SQS



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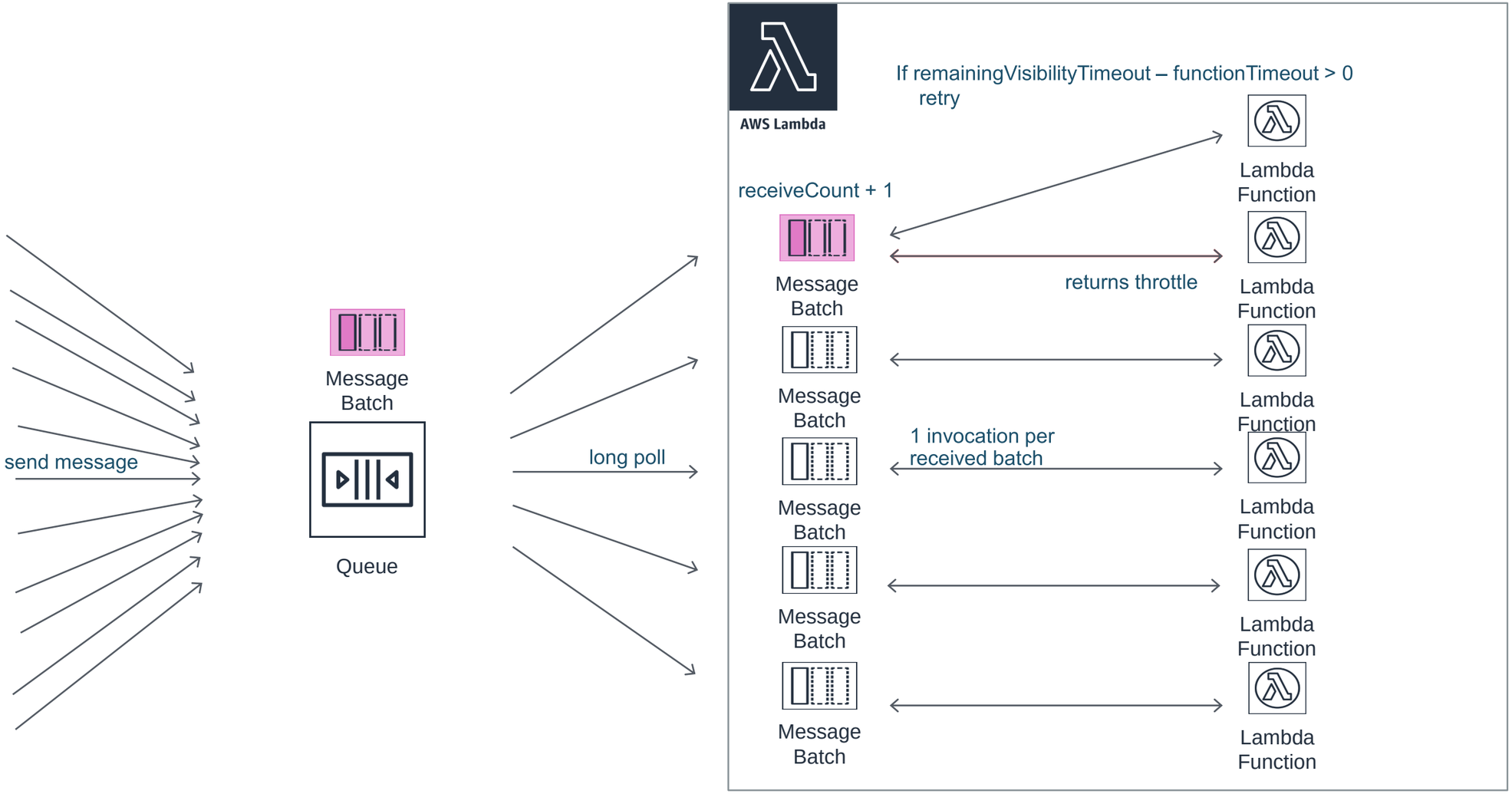
Amazon SQS to Lambda: Details



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Demo

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SQS Management Console | Lambda Management Console | CloudWatch Management Consc | Using AWS Lambda with Amazo

https://ca-central-1.console.aws.amazon.com/sqs/home?region=ca-central-1#queue-browser:noRefresh=true;prefix=

aws Services Resource Groups Admin/jwojciak-Isengard @ 10... Central Support

Create New Queue | Queue Actions

Filter by Prefix: Enter Text...

No items

Name	Queue Type	Content-Based Deduplication	Messages Available	Messages in Flight	Created

Feedback English (US)

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Limiting concurrency

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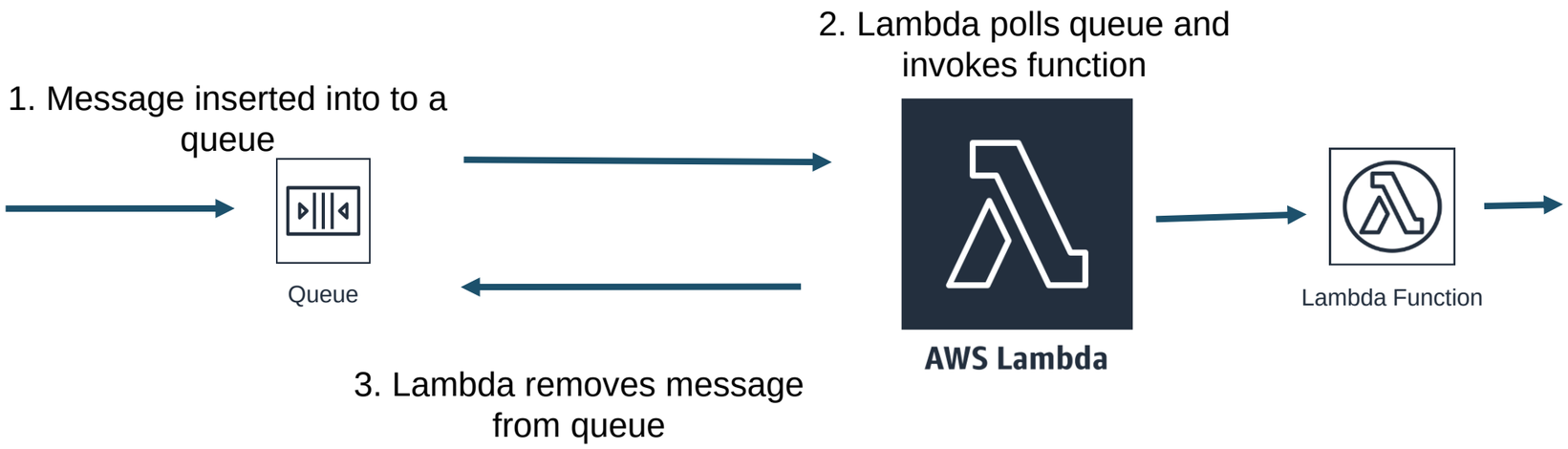
Highly scalable processing



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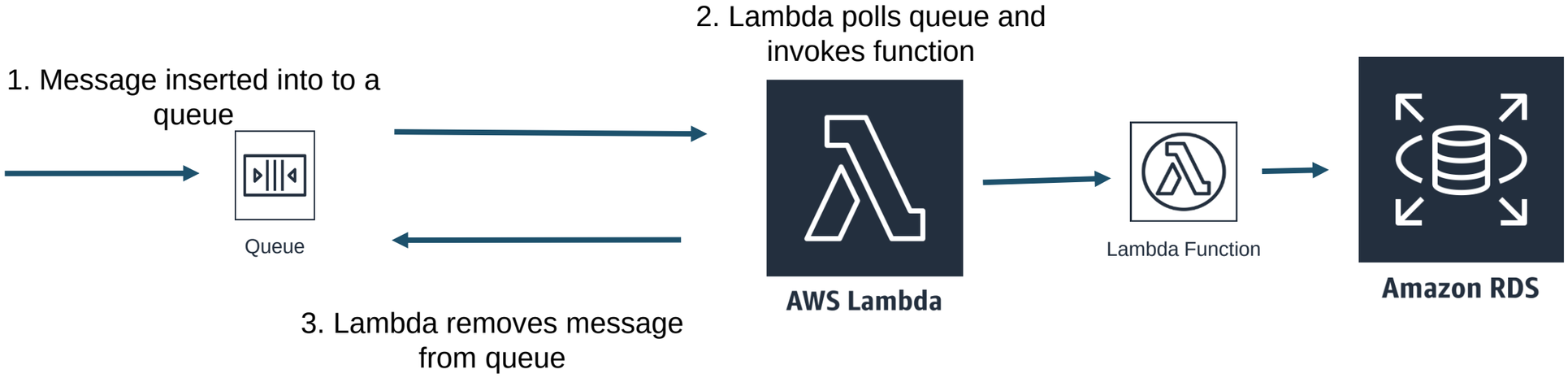
Downstream dependency with a limit



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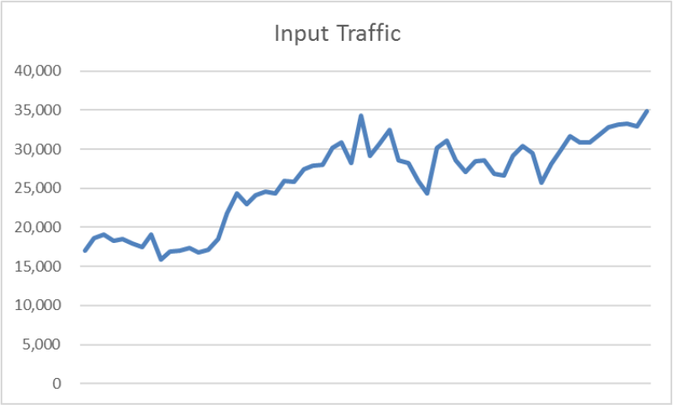
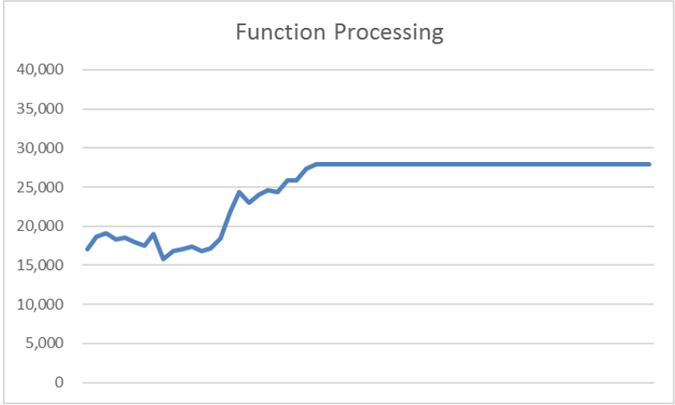
Limiting concurrency





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Account vs Function concurrency limit

Account limit is shared across all Functions without a limit

Function limit is not shared with other functions

Recommendation: set a concurrency limit to avoid surprises

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Demo

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SQS Management Console | Lambda Management Console | CloudWatch Management Conso | Using AWS Lambda with Amazo

https://ca-central-1.console.aws.amazon.com/sqs/home?region=ca-central-1#queue-browser:selected=https://sqs.ca-central-1.amazonaws.com/100876612398/webinar-demo-sqs;prefix=

aws Services Resource Groups Admin/jwojciak-Isengard @ 10... Central Support

Create New Queue | Queue Actions

Filter by Prefix: Enter Text... 1 to 1 of 1 items

Name	Queue Type	Content-Based Deduplication	Messages Available	Messages in Flight	Created
webinar-demo-sqs	Standard	N/A	0	631	2019-02-07 21:49:15 GMT-08:00

1 SQS Queue selected

Details | Permissions | Redrive Policy | Monitoring | Tags | Encryption | Lambda Triggers

SQS metrics

Time Range: Last Hour

Below are your CloudWatch metrics for the selected resources (maximum of 10). Click on a graph to see an expanded view. All times shown are in UTC. View all CloudWatch metrics

Legend: webinar-demo-sqs

NumberOfMessagesSent (Count)

NumberOfMessagesReceived (Count)

Feedback English (US)

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Recap

Amazon SQS and AWS Lambda are better together!

Mind the timeouts

Control concurrency

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Thank you!

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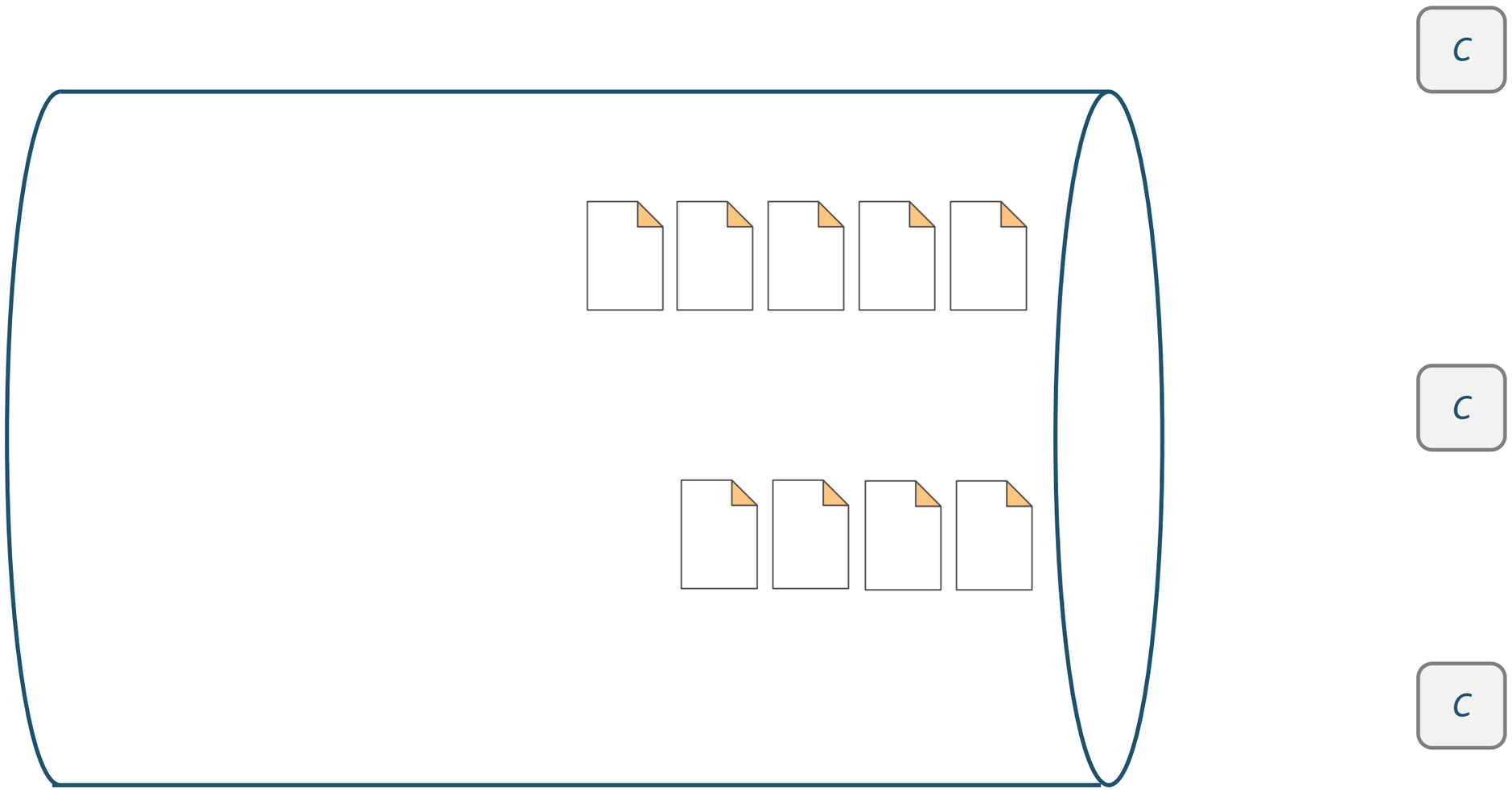
Consuming from Kinesis Data Streams



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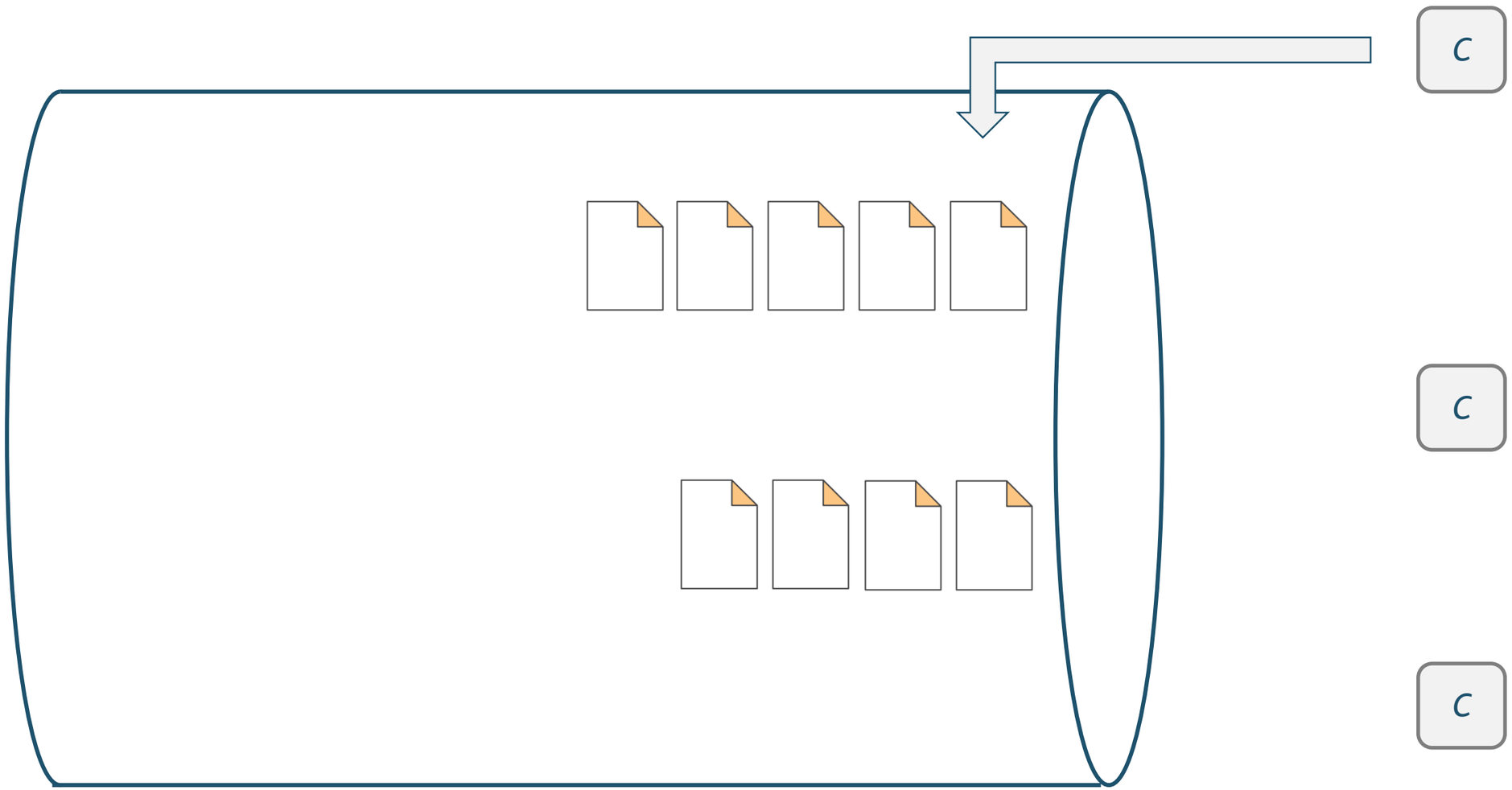

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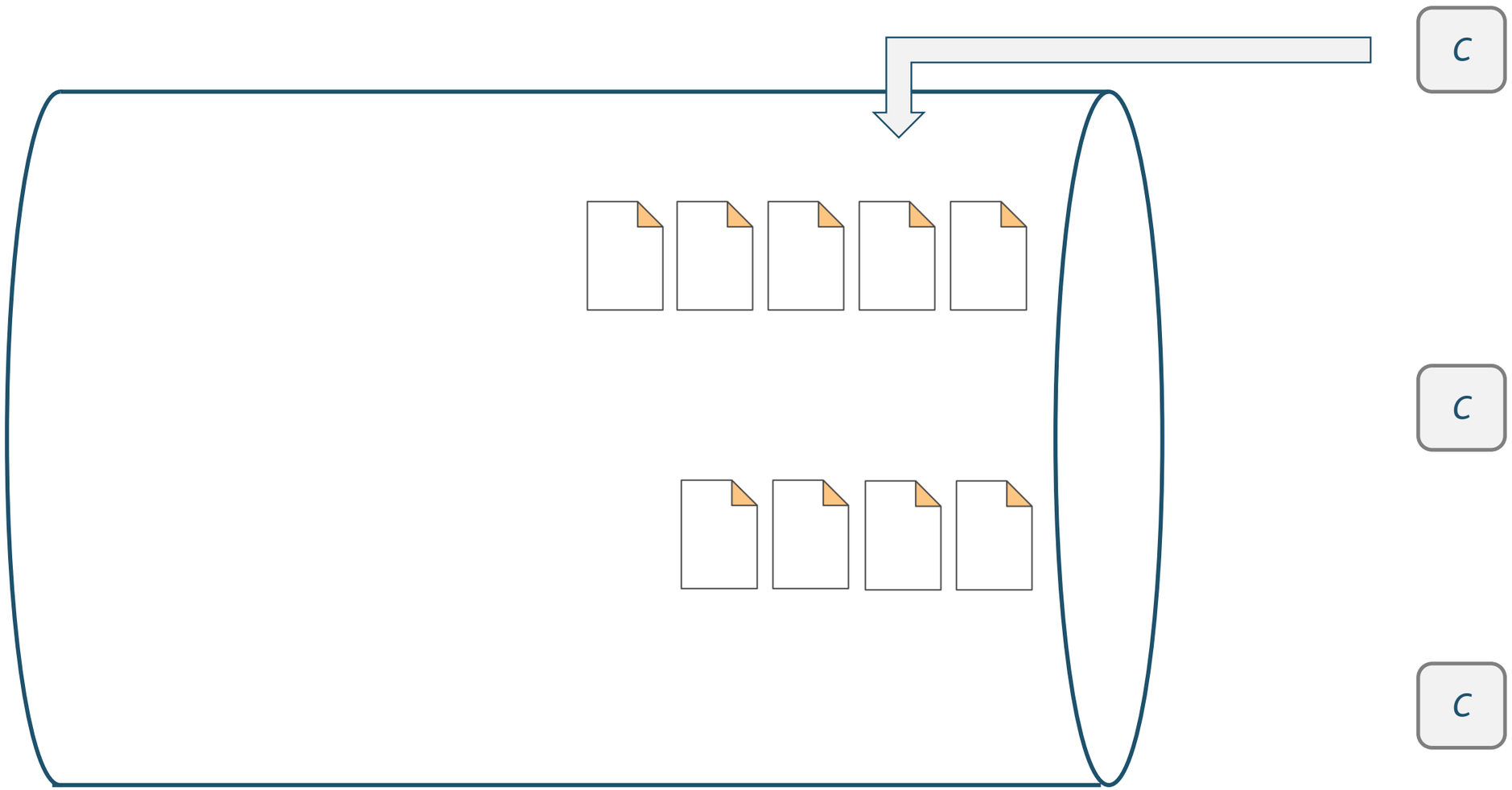

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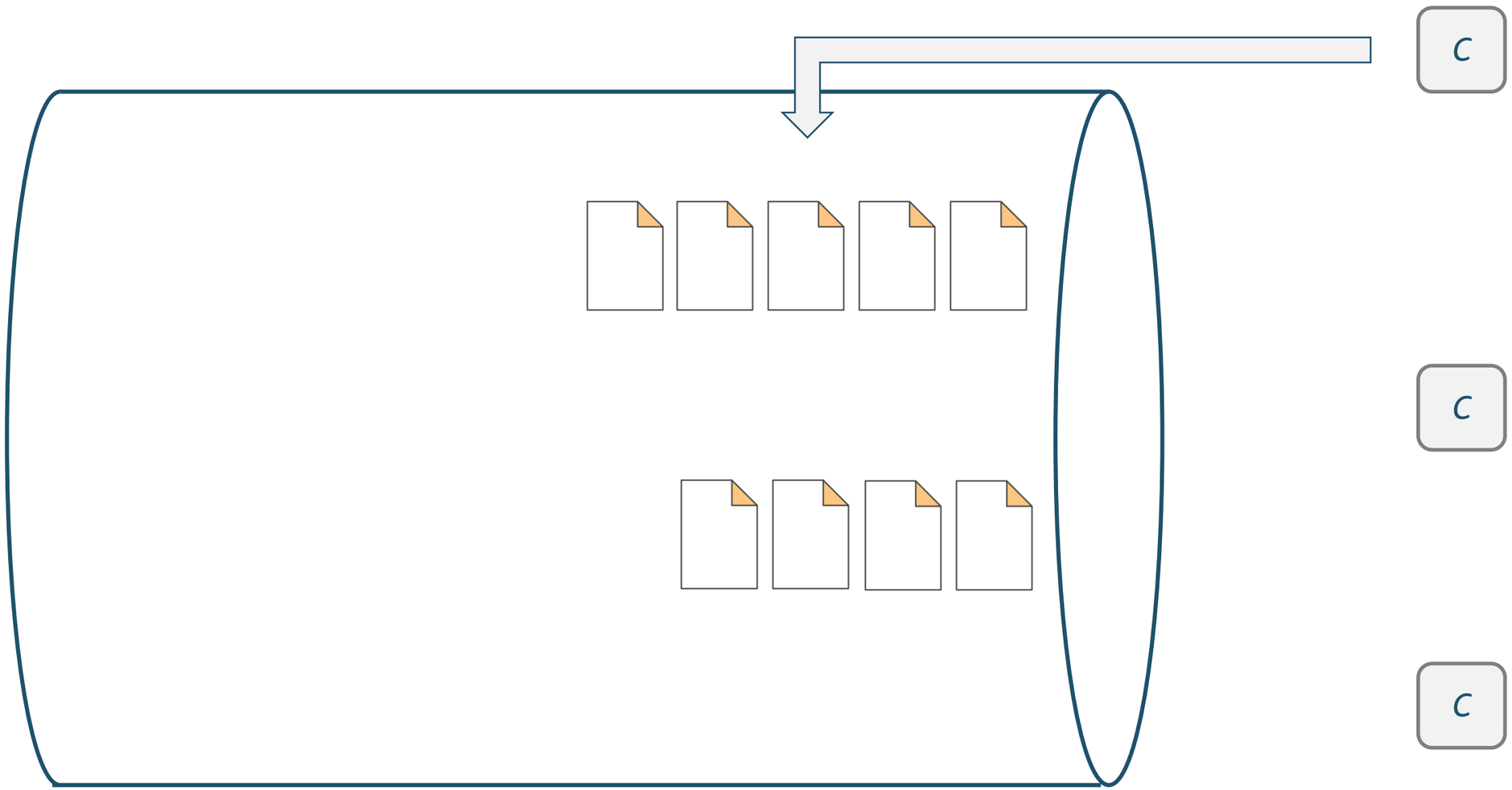

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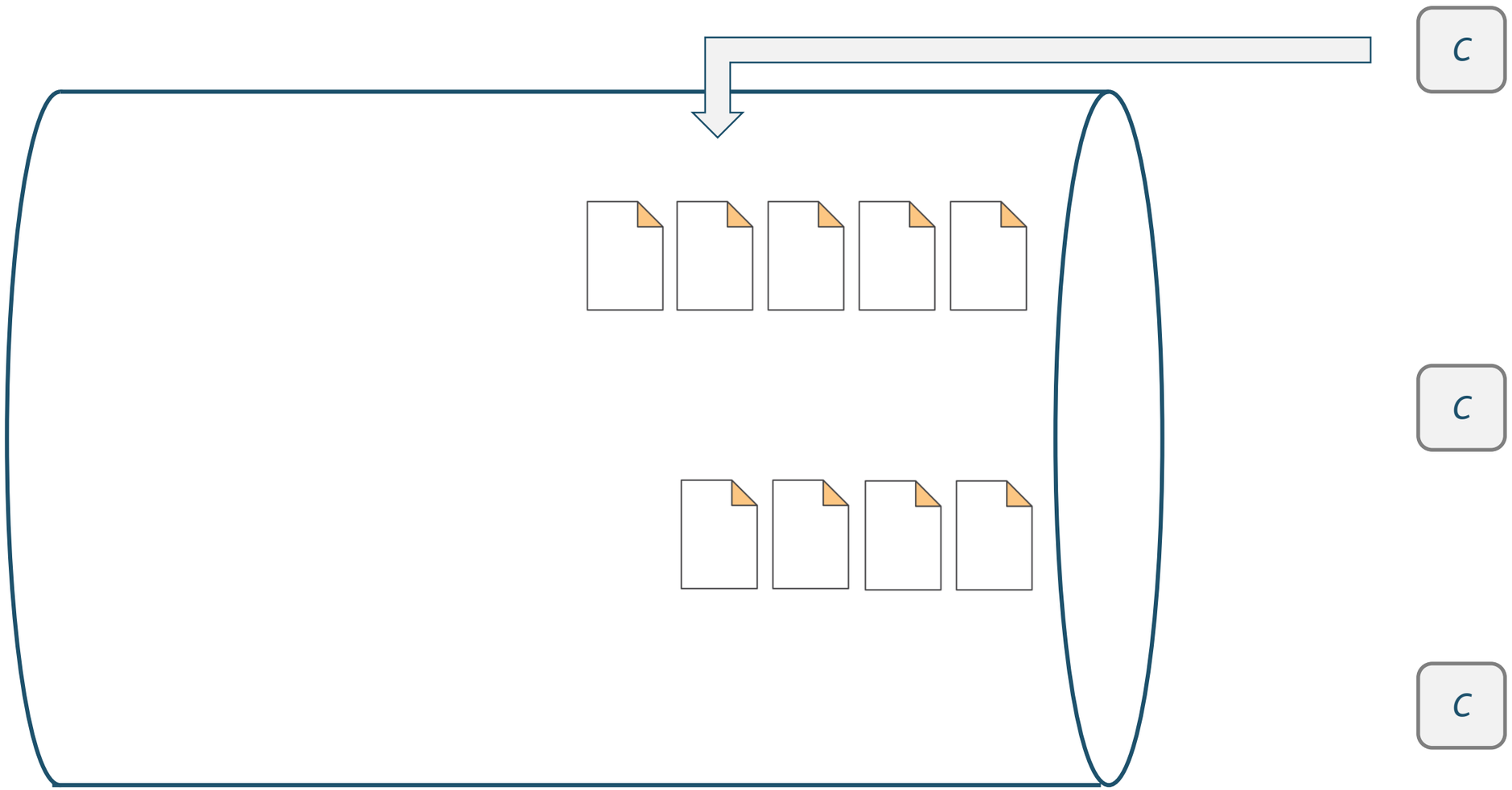

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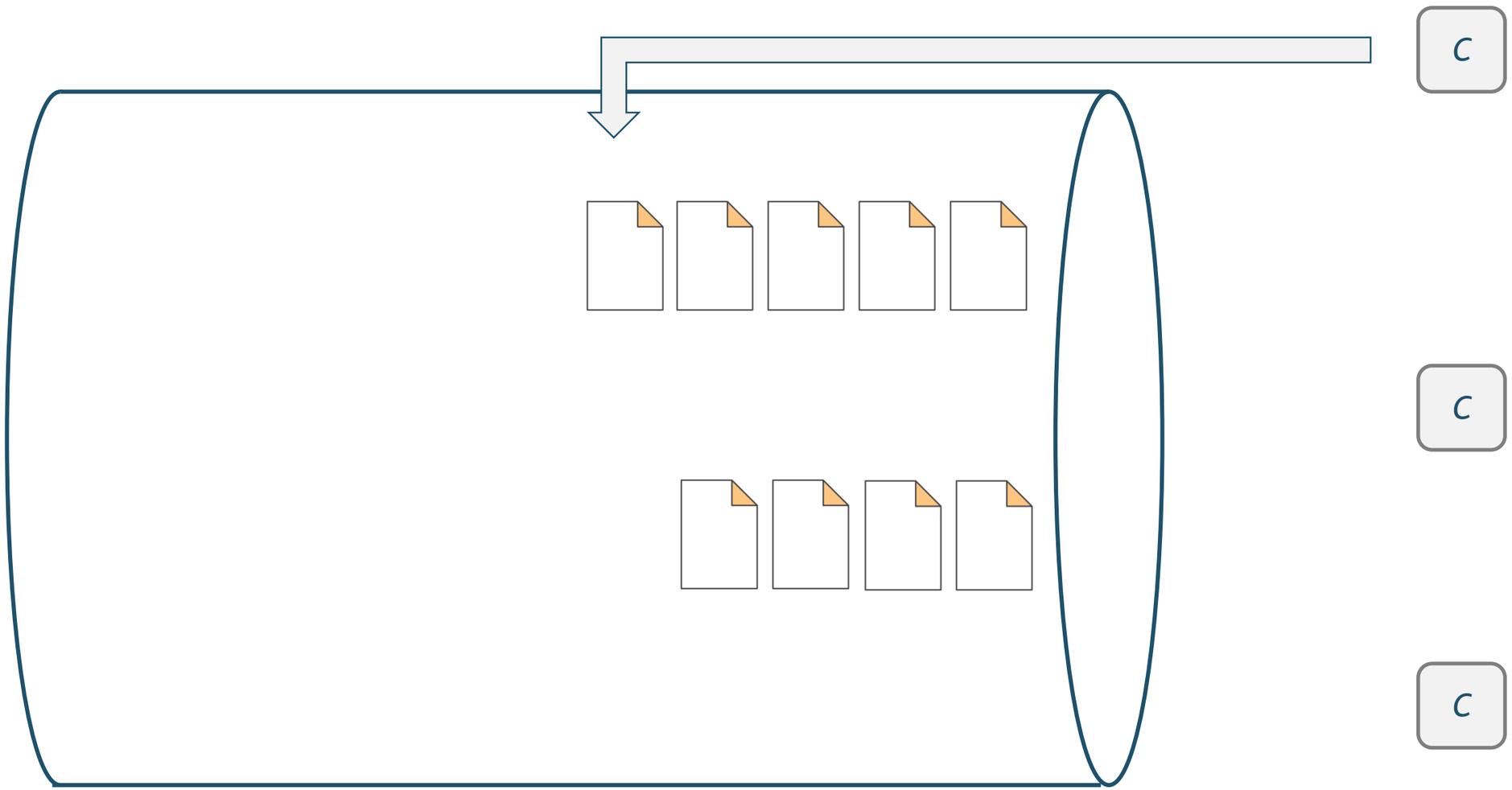

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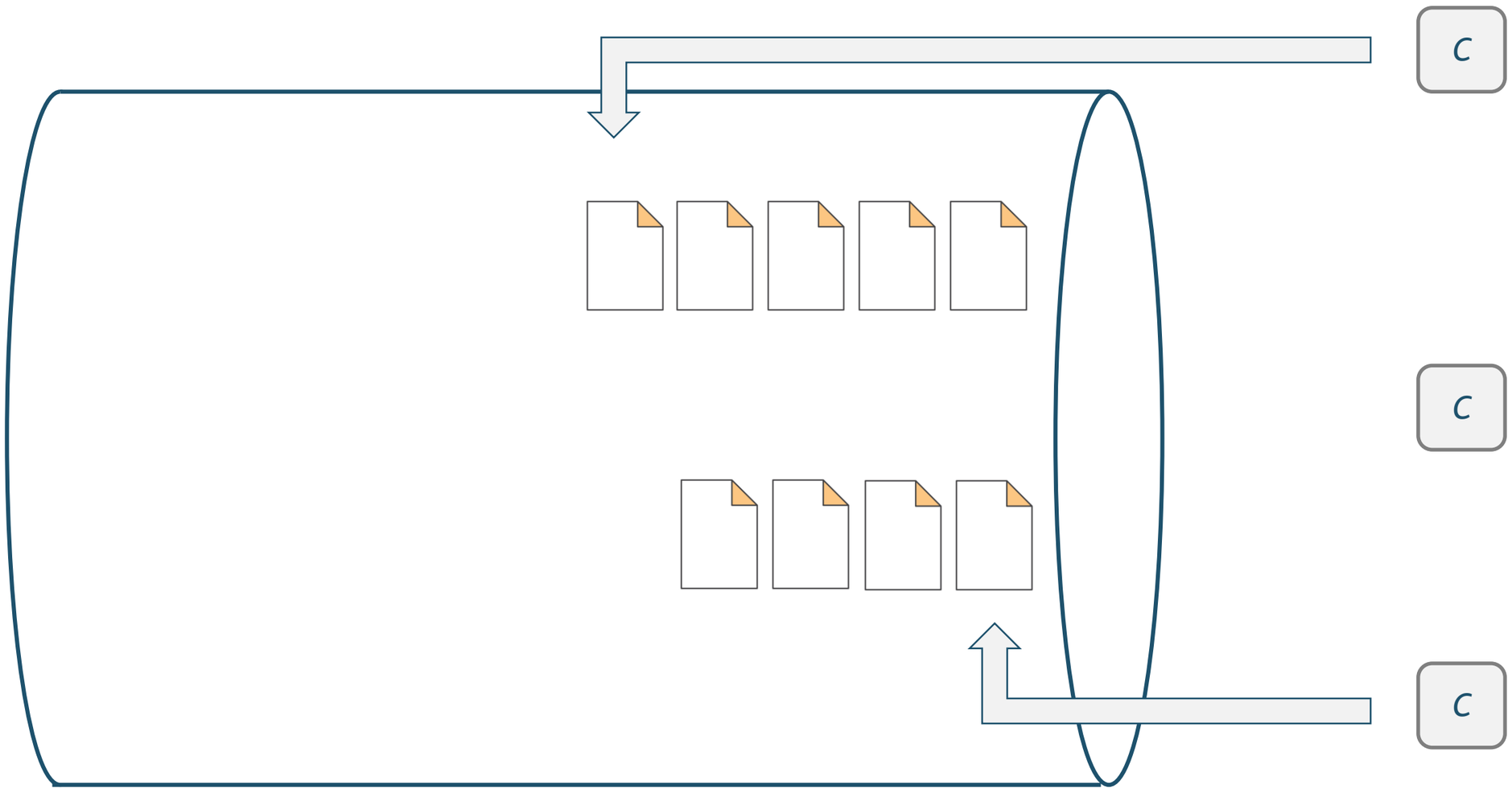

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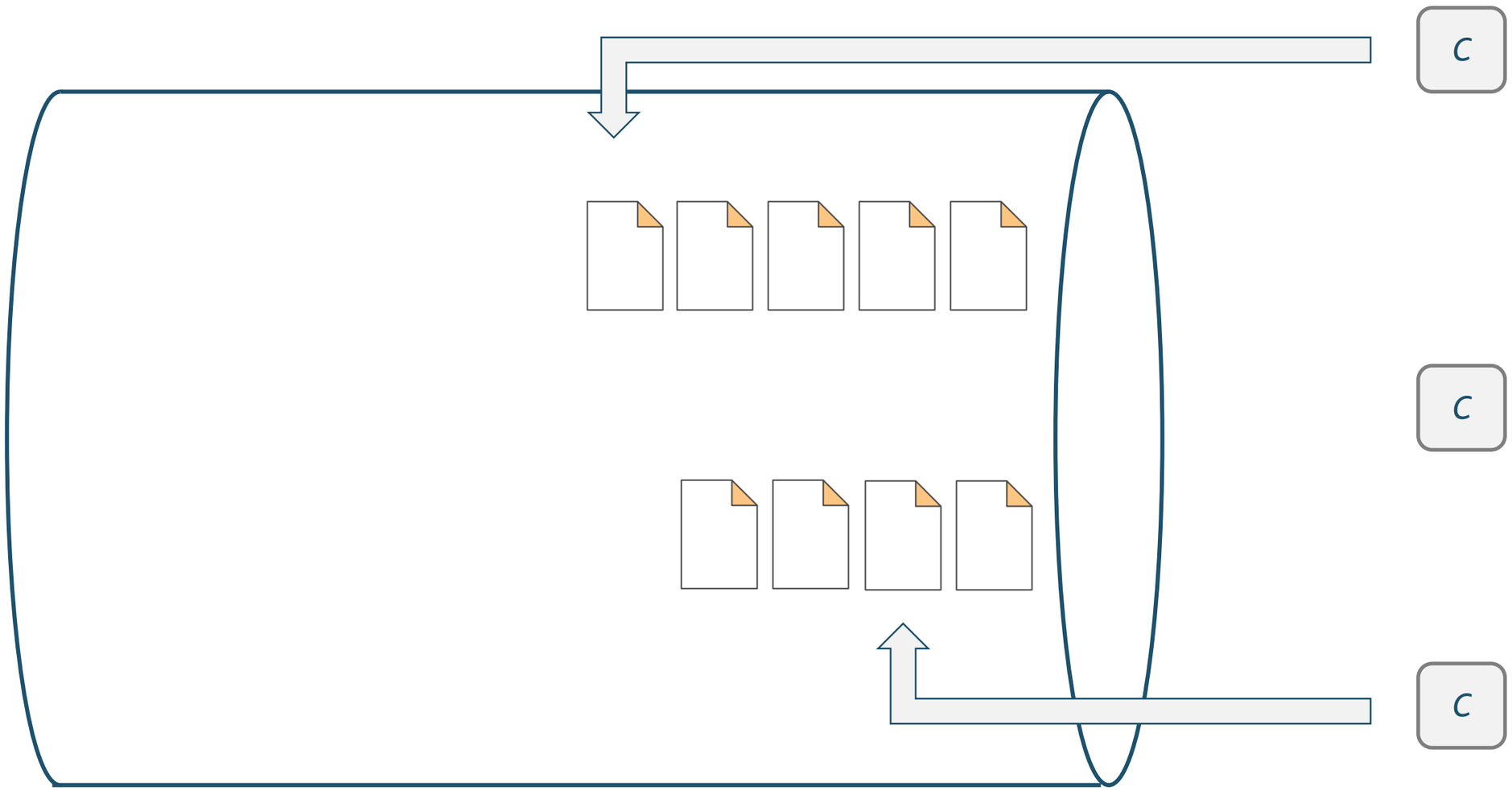

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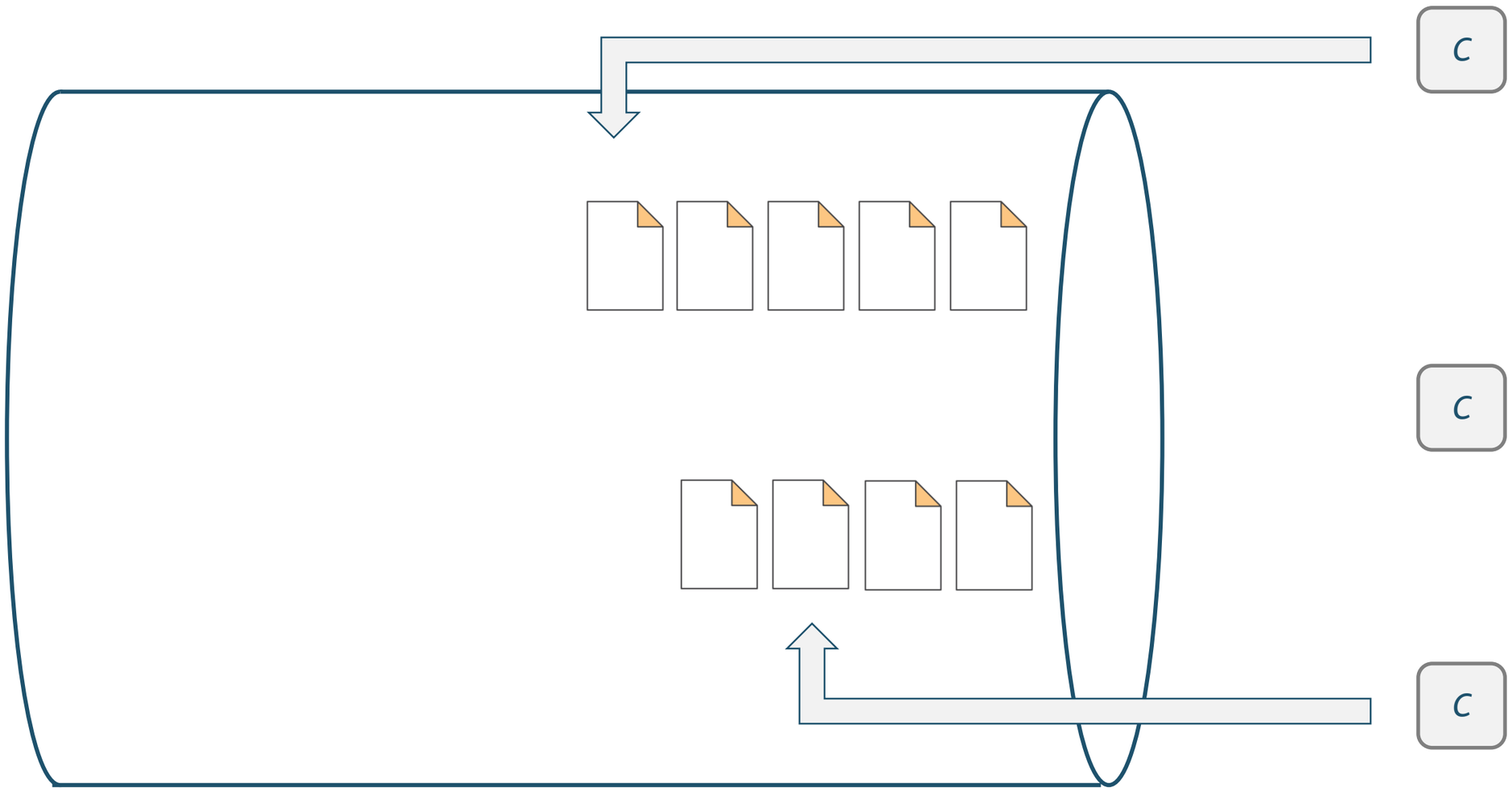

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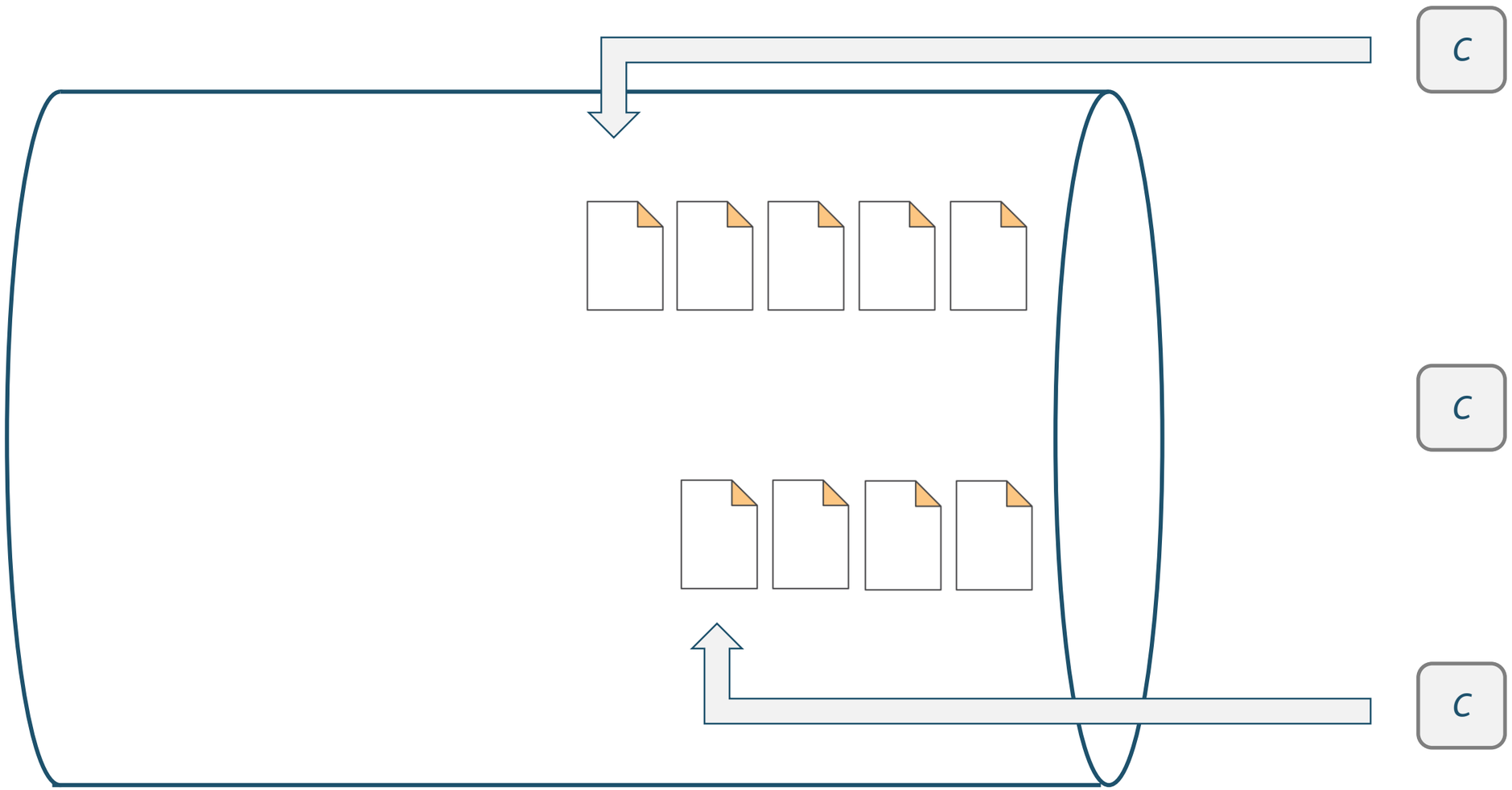
Consuming from Kinesis Data Streams



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Thank you!

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