
AWS
re:Invent
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STG311-R

Building serverless, modern applications using Amazon S3 or Amazon EFS

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Who is currently using serverless compute today?

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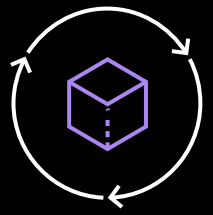
If you raised your hand, what are you doing?

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If you didn’t, what use cases would you like to solve?

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Serverless is about focusing on business value



Agility

Get to market faster, deliver features



Performance

High performance and scalability



Cost

Pay for value, build with lower TCO



Security

Security and isolation by design

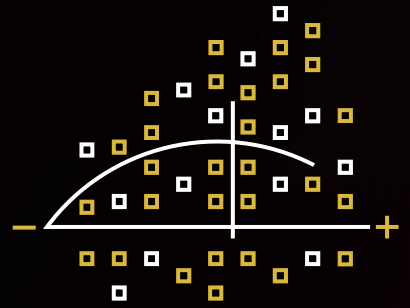
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What are customers building with serverless?



IT automation



Data processing



Web applications



Machine learning

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Serverless is more than just compute

COMPUTE


AWS Lambda


AWS Fargate

DATA STORES


Amazon S3


Amazon EFS


Amazon DynamoDB

INTEGRATION


Amazon API Gateway


AWS AppSync


Amazon SQS


Amazon SNS


AWS Step Functions


Amazon EventBridge

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Local storage for a function



Your code artifact





AWS Lambda

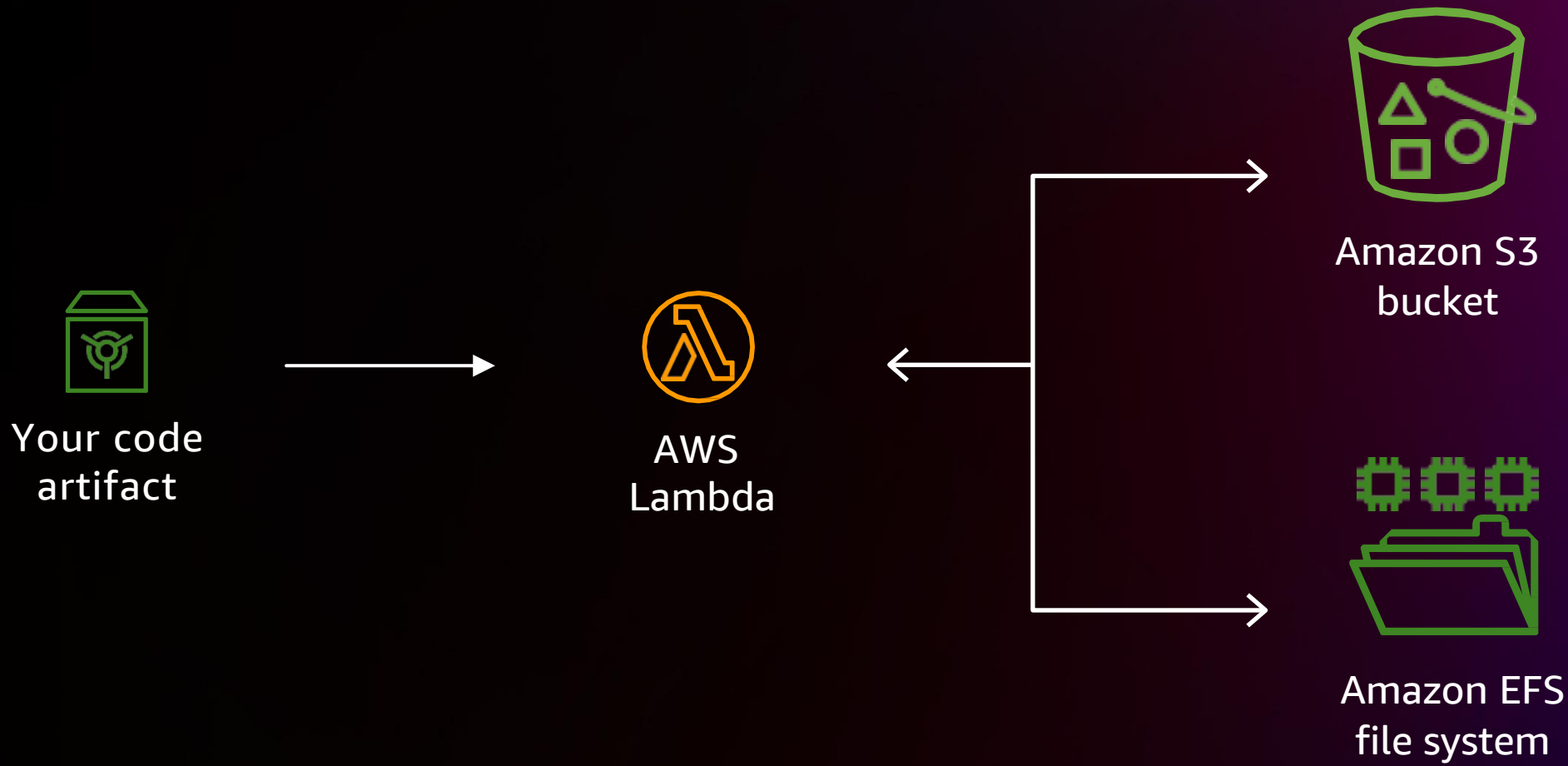
Memory
(128 MB –10 GB)

/tmp space
(512 MB – 10 GB)

Deployment package
(<250 MB)

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External storage options for a function



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Digging into storage options

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Amazon S3 and Amazon EFS are cloud native

Secured using cloud constructs

- AWS Identity and Access Management (IAM)
- AWS KMS

Protected using cloud constructs

- AWS Backup
- Amazon EFS replication
- Amazon S3 replication

Consumable from any cloud compute

- AWS Lambda
- AWS Fargate
- Amazon ECS/ Amazon EKS
- Amazon EC2

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Object storage for AWS builders



Amazon S3

Serverless object storage



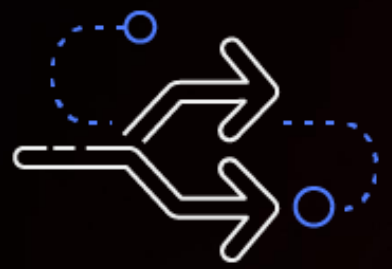
Object store



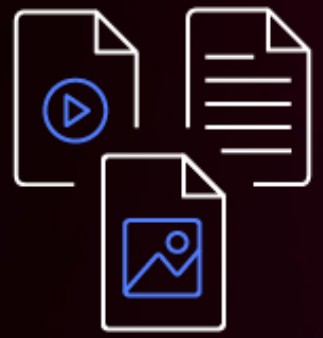
Elastically scales



Highly durable



Versions and lifecyle management



Different storage classes



Event source for AWS Lambda

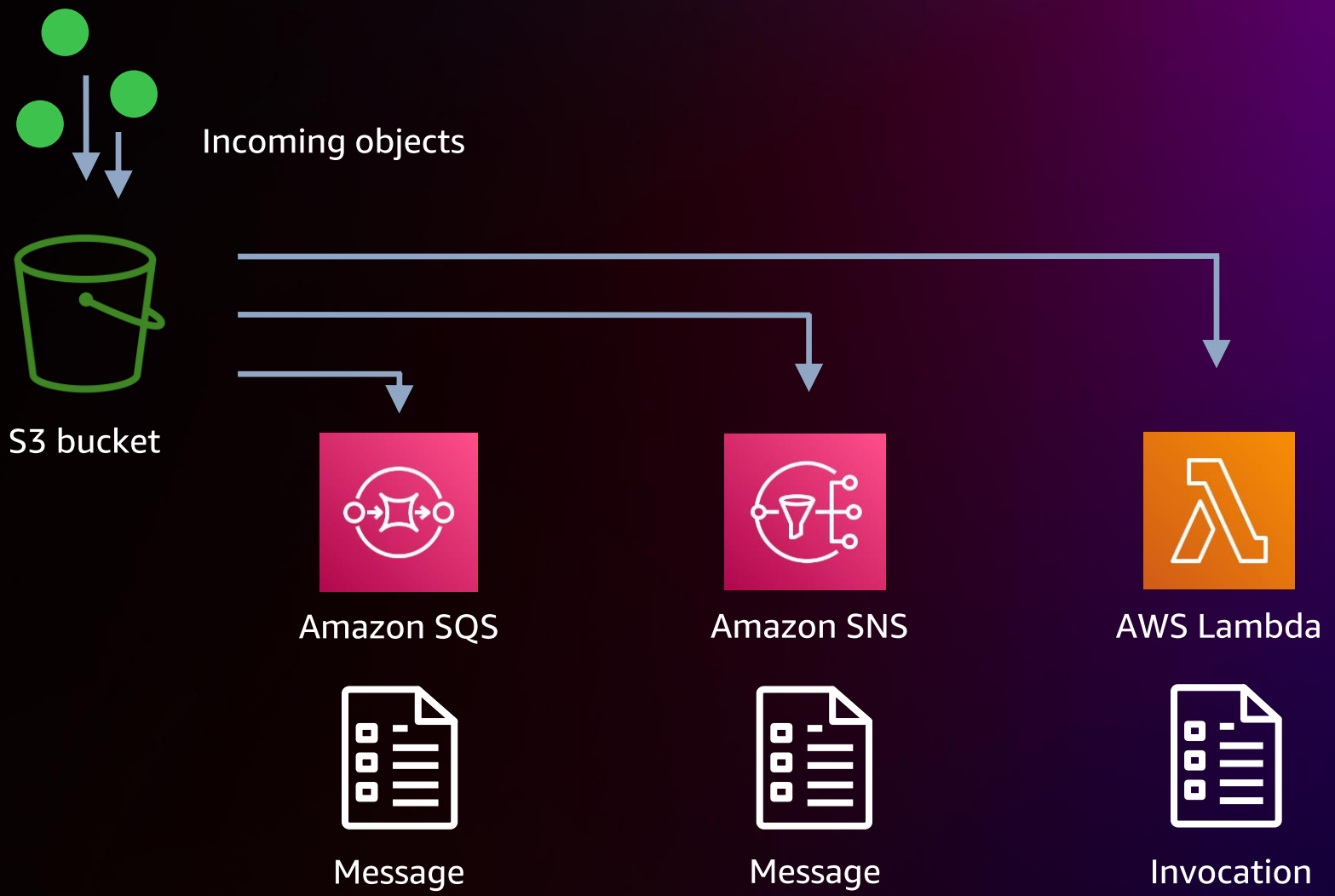
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Amazon S3 Event Notifications

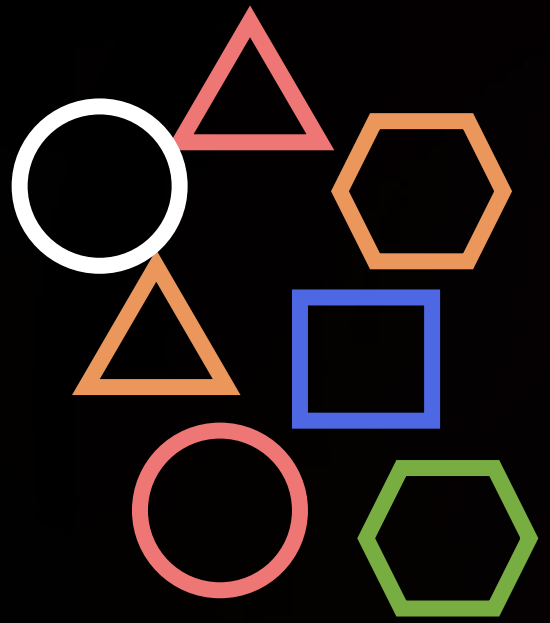
Reliable and scalable notifications

- At-least-once delivery
- Multiple delivery destinations
- Low latency, no charge
- Notifications on create, delete, restore, replication, and lifecycle actions



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What we want serverless applications to look like



Diverse set of objects in an S3 bucket

Analytical workloads

Audio sentiments

Video transcoding

Optical character recognition

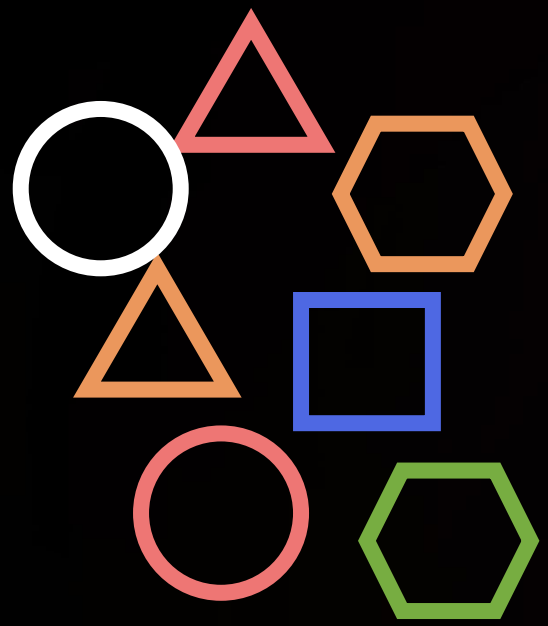
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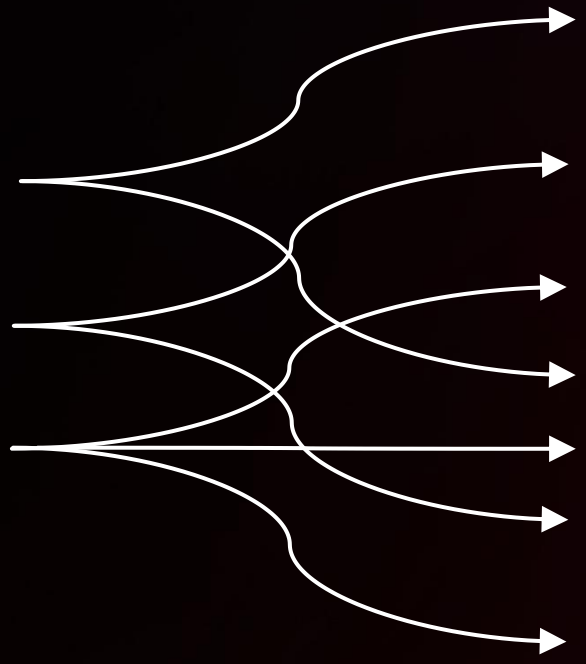
Translation at scale



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What it actually looks like







Diverse set of objects in an S3 bucket

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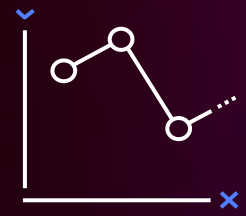
EventBridge and S3 make serverless easier



Trigger multiple event-driven workflows based on changes to your data



Filter objects for your applications with industry-leading pattern matching



Fast and reliable invocations with at-least-once delivery guarantee

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Amazon S3 Object Lambda



Add your own code to S3 GET, HEAD, and LIST requests to process and modify data returned to an application

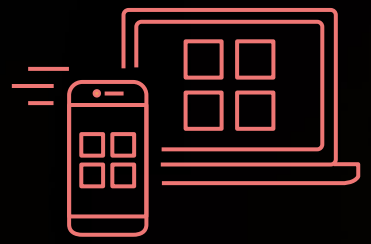
Fully managed, powered by AWS Lambda functions

Eliminates the need to create and store derivative copies of your data, and requires no application changes

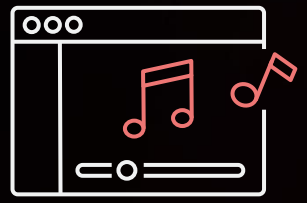
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Use cases for Amazon S3 Object Lambda



Compression and decompression



Audio and video transcoding



Custom authorization

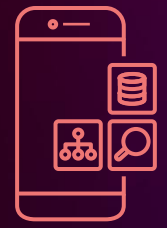


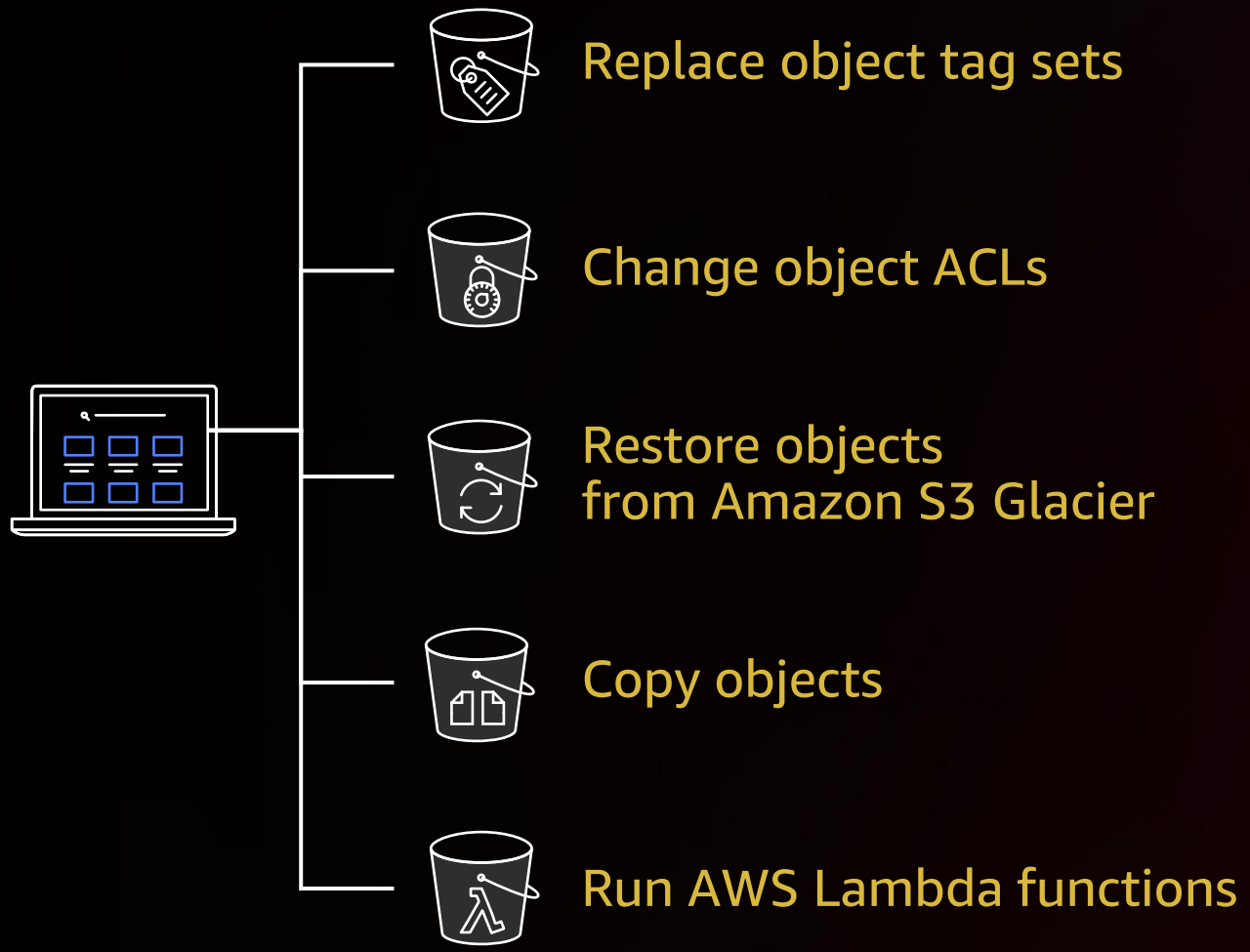
Image resizing and watermarking

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Amazon S3 Batch Operations

Save time when performing one-time or recurring actions at scale



Manage millions or billions of objects with a single request

Automatically handles retries, displays progress and generates reports

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File storage for AWS builders

"Just works"

- Fully elastic, scalable storage
- Highly durable (11x9s)
- Highly available

Modern integrations

Fully integrated with services like Amazon ECS, Amazon EKS, AWS Lambda to support modern applications



Amazon EFS

Serverless, elastic file system

High performance

- Latencies as low as 0.6 ms
- Up to 35 K IOPS
- Up to 3 GB/s of throughput

Cost optimized

- Pay for what you use model
- Automatically tier infrequently accessed data to colder storage

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Amazon EFS with AWS Lambda

Elastic, shared, serverless storage

Petabyte-scale elastic storage for Lambda functions

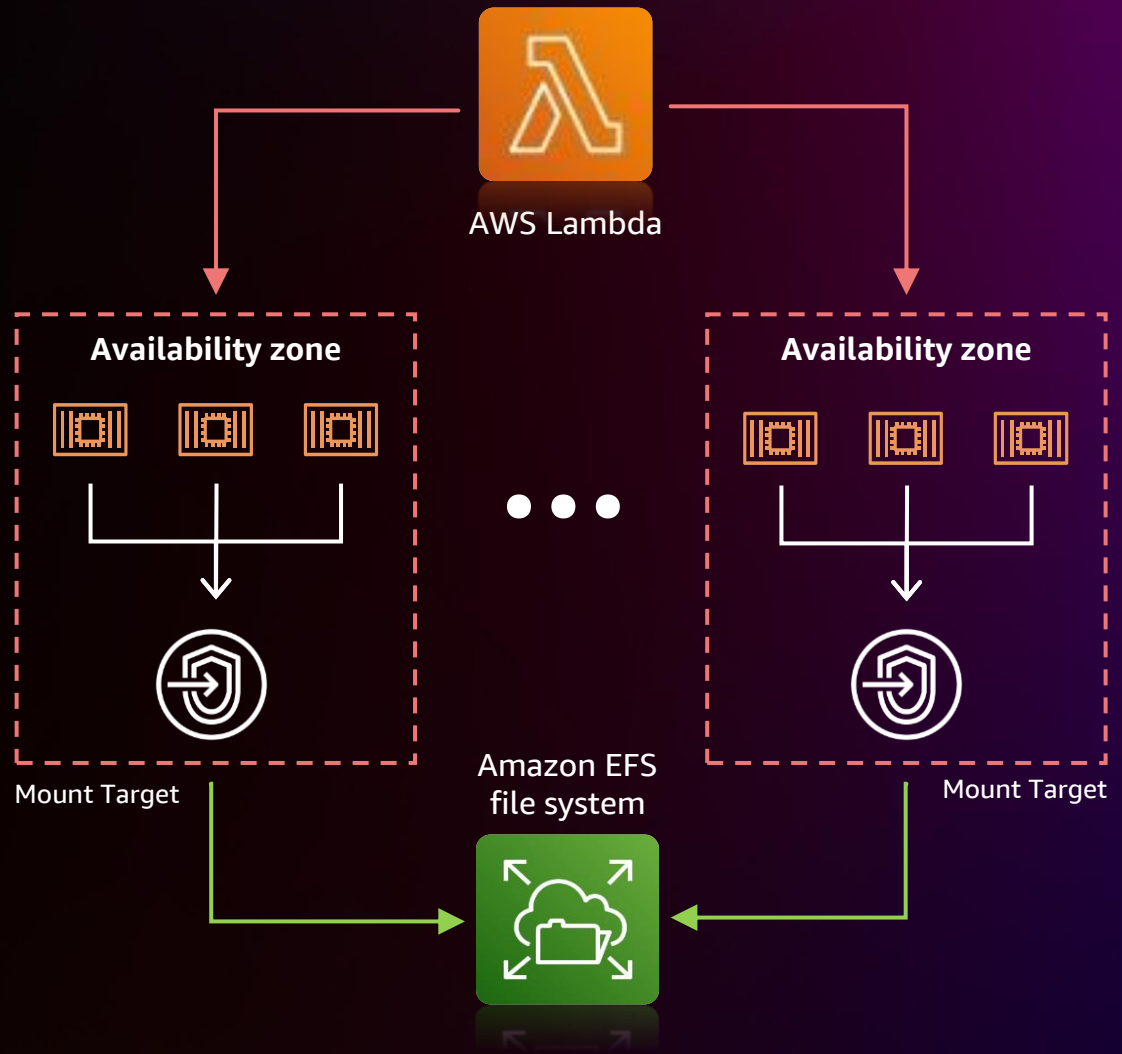
Build stateful applications

Low-latency

Pay for what you use

Serverless storage

Share data across 1000s of function invocations



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Based on what you learned, any use cases that you might want to build?

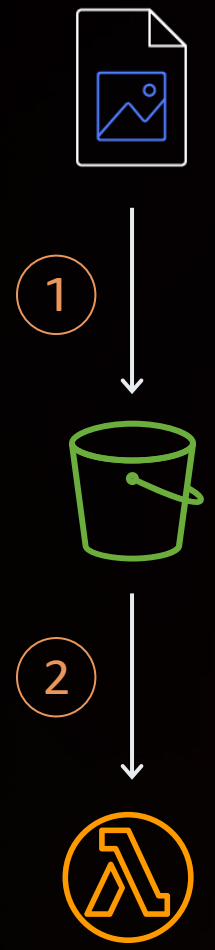
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Serverless use cases

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Processing file uploads quickly

Resize photo, extract text, translate, and more

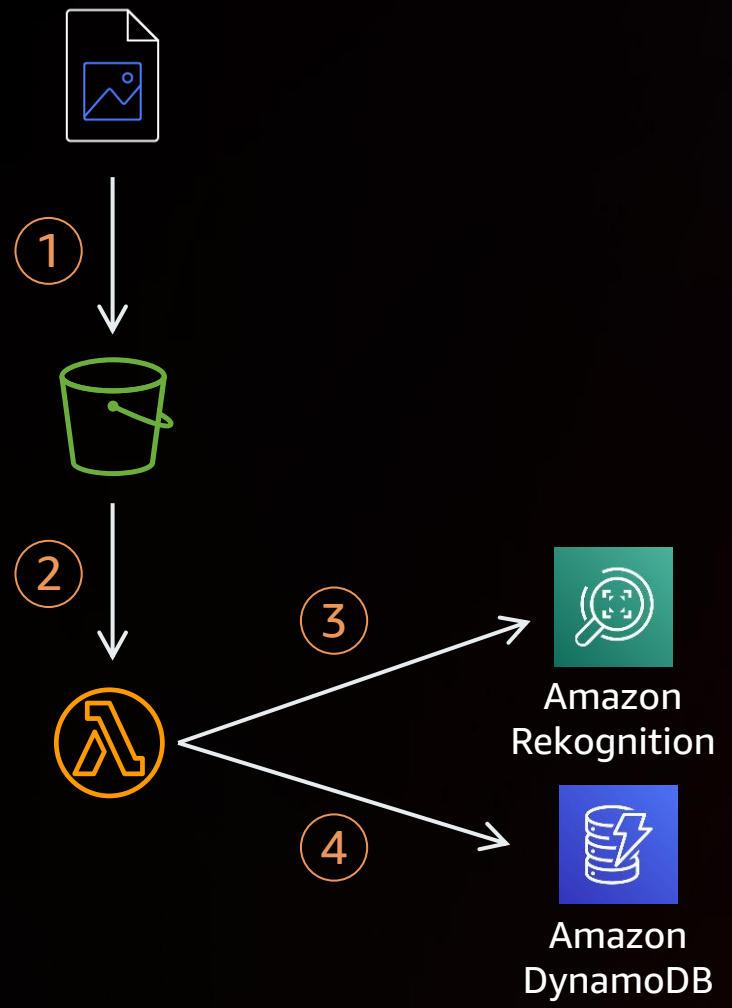


1. Object uploaded to Amazon S3 bucket
2. **Asynchronous** invoke of Lambda function, event payload includes:
   - Bucket name
   - Object key

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Processing file uploads quickly

Add image analysis and metadata storage



3. Analyze photo with Amazon Rekognition
4. Store image details and results of analysis

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Ingesting and storing streaming data

Consume, process, and store data



1. Lambda service polls Kinesis data streams for messages
2. Function is synchronously invoked with batches of messages
3. Function processes and/or pushes data to downstream data stores

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Elastic inference with Lambda and Amazon EFS

Deploying machine learning inference endpoints

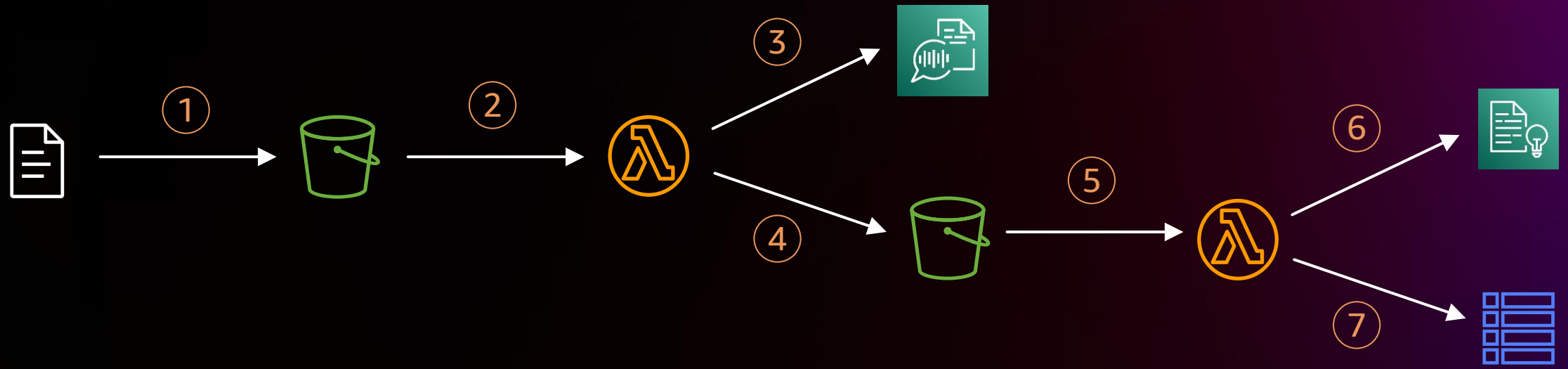


Amazon EFS provides the needed storage to:

- Import large **ML models**
- Load extra **code libraries**

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Converting call center recordings into useful data for analytics

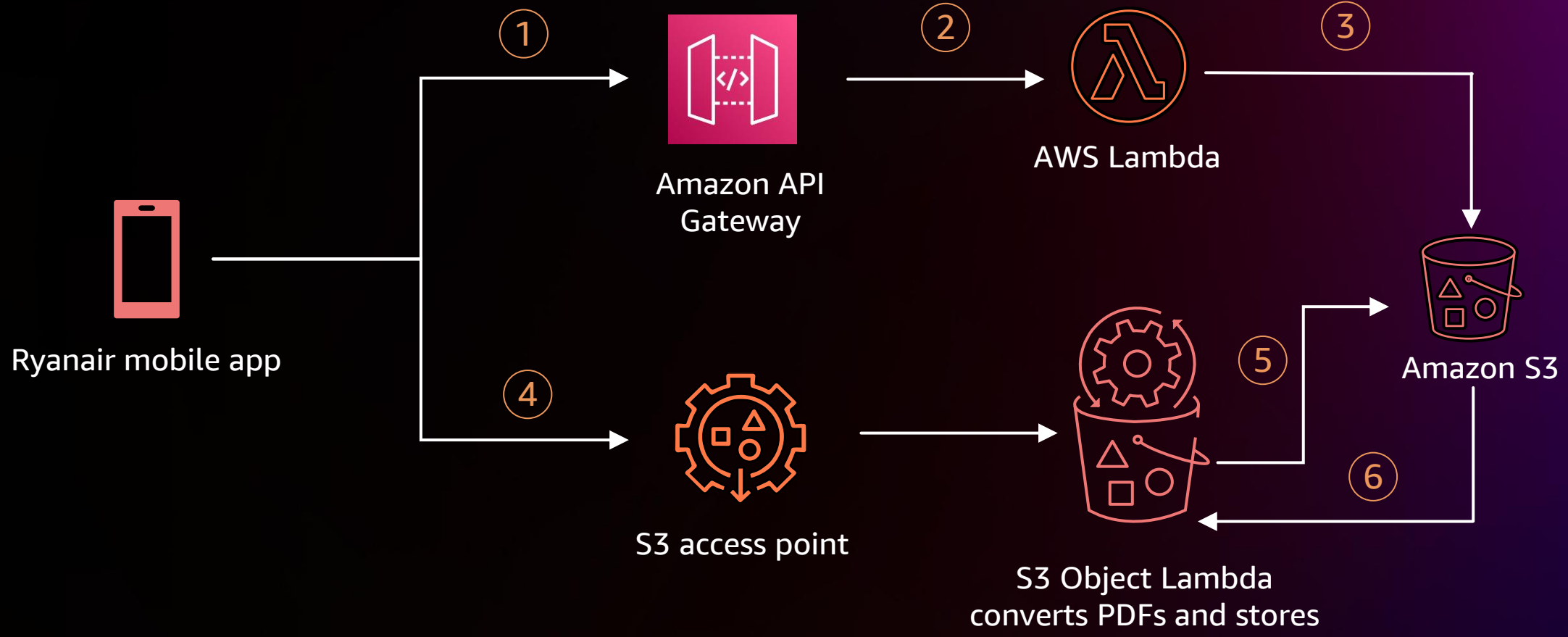


1. User or application uploads mp3 file to S3
2. S3 event triggers a Lambda function
3. Lambda function calls Amazon Transcribe to convert audio to text
4. Lambda function stores transcription as an object in S3
5. S3 event triggers another Lambda function
6. Lambda function calls Amazon Comprehend for sentiment analysis
7. Lambda function stores the resulting data in a DynamoDB table

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Ryanair COVID-19 mobile wallet with S3 Object Lambda



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Other sessions

STG001: Use S3 Object Lambda to transform objects for virtually any use case

STG002: Enhance throughput benefits with Amazon EFS

STG303: AWS storage for containers and serverless applications

STG316: Transforming your data with Amazon S3 Object Lambda

SVS201: Thinking serverless: From business problem to serverless solutions

SVS203: Getting started with serverless

SVS209: Get started building your first serverless, event-driven application

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Thank you!

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