

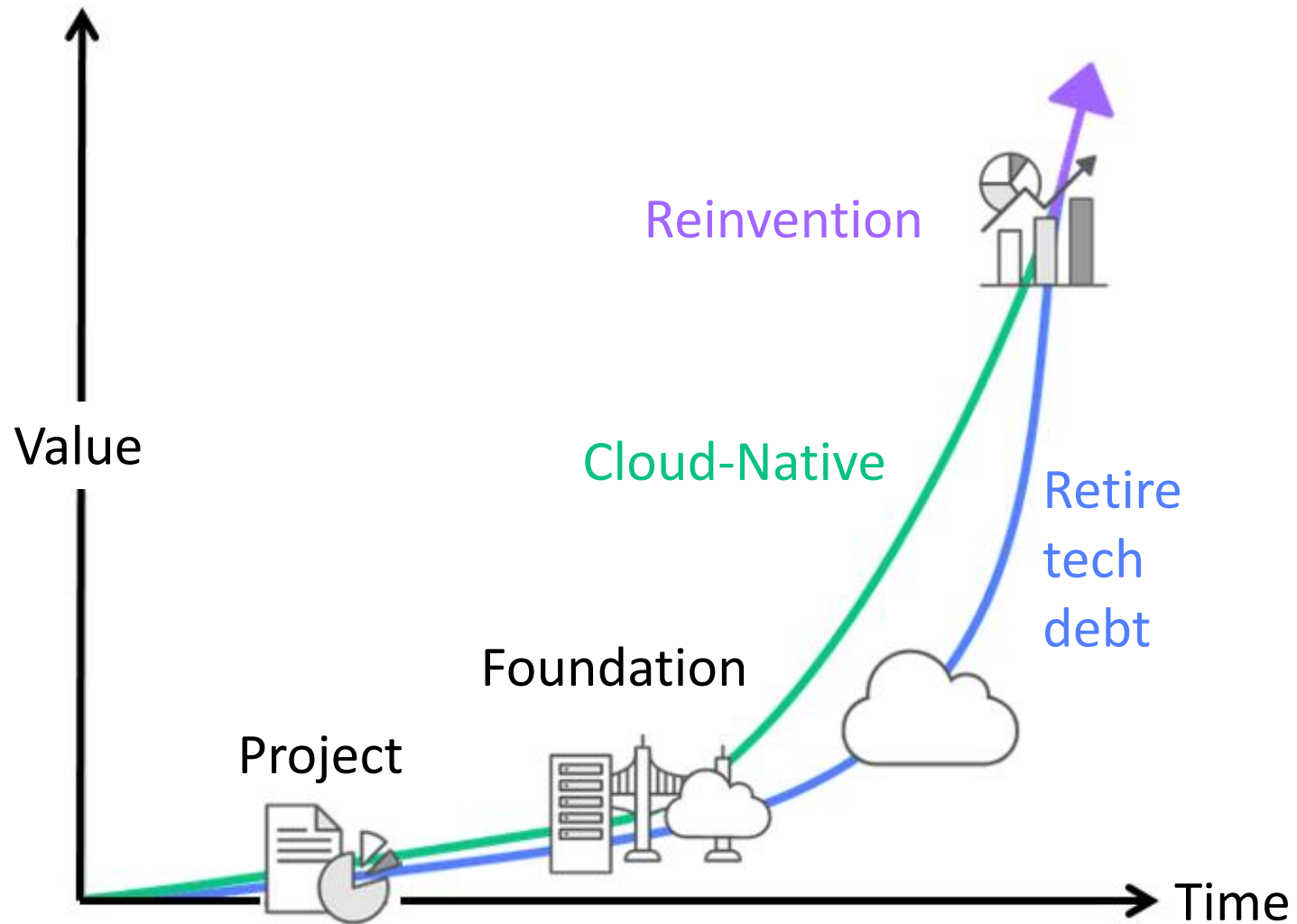
Module 3: Building in the cloud

Marcia Villalba
Developer Advocate
[@mavi888uy](#)

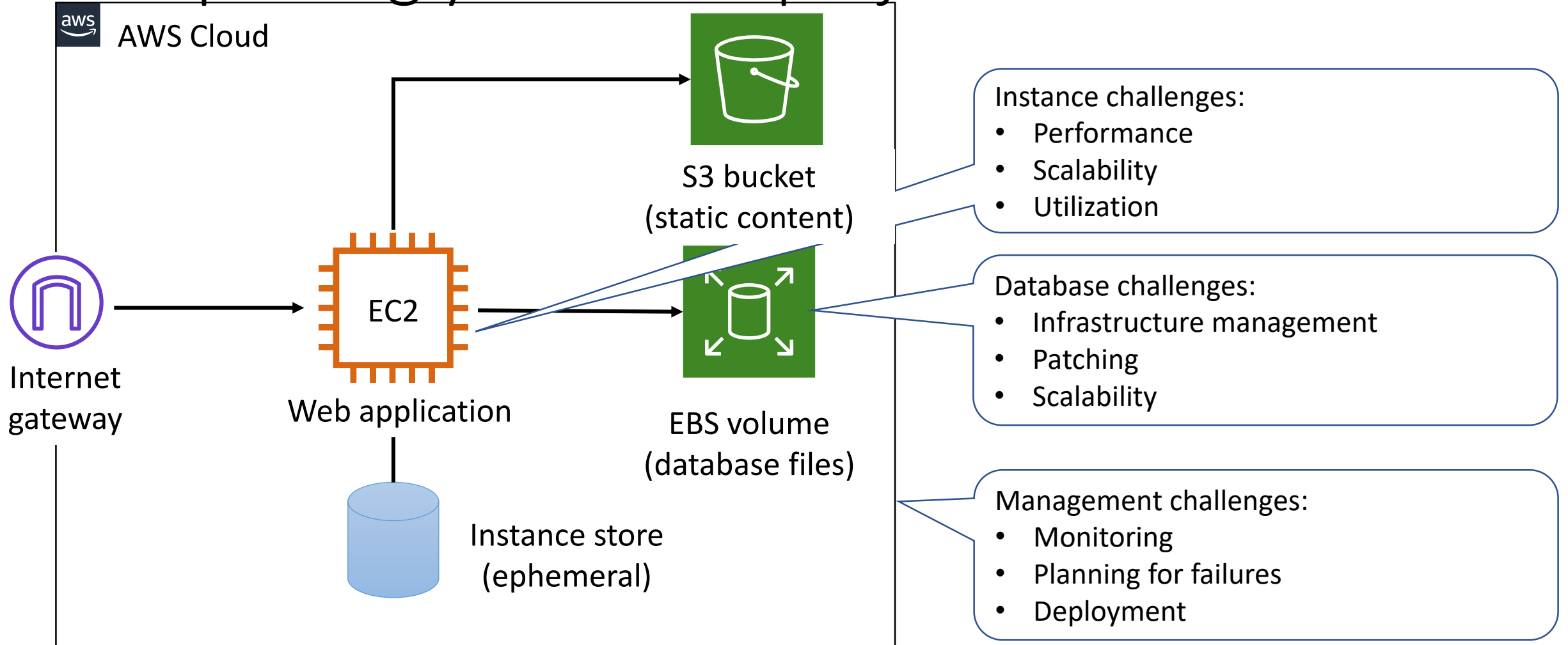


Go beyond servers and storage

Migration and reinvention

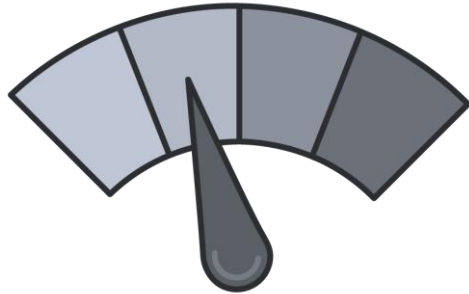


Improving your initial project

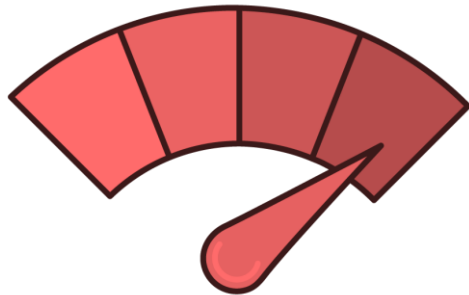


Monitor AWS resources

What is Amazon CloudWatch?

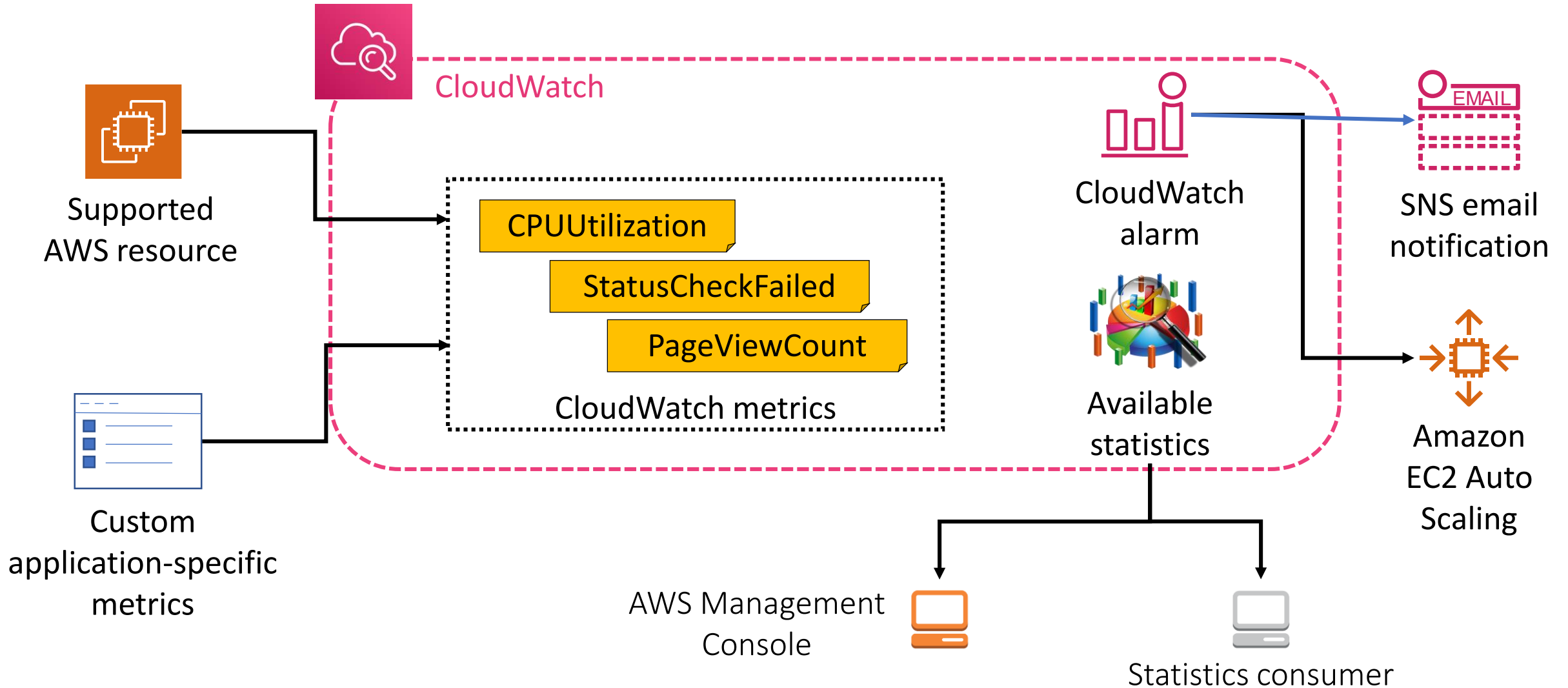


- Monitors:
 - AWS resources
 - Applications running on AWS



- Collects and tracks:
 - Standard metrics
 - Custom metrics
- Alarms:
 - Send notifications
 - Automatically make changes based on rules you define

How CloudWatch works



CloudWatch benefits



Access all your metrics from a single platform



Maintain visibility across your applications, infrastructure, and services



Reduce mean time to resolution (MTTR) and improve total cost of ownership (TCO)



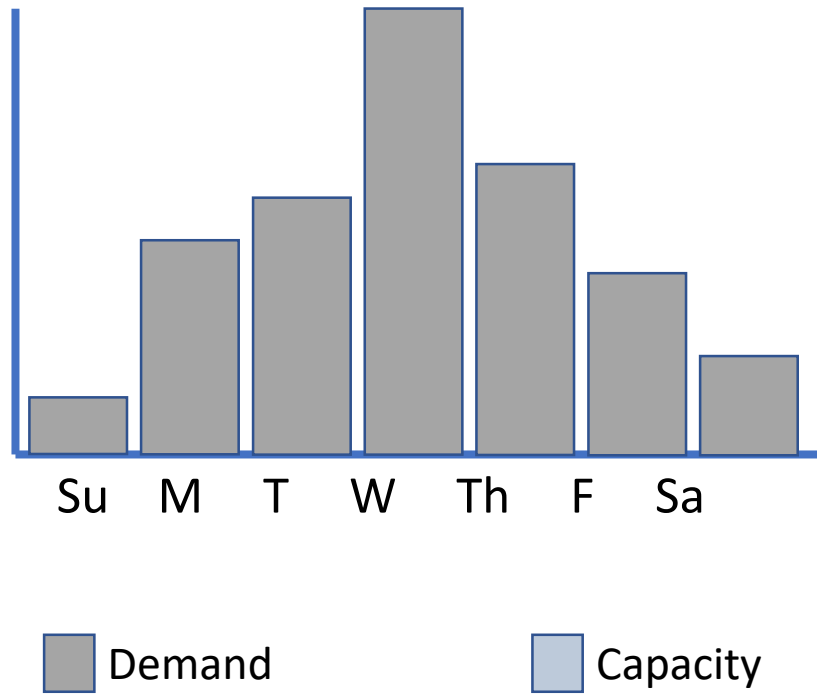
Drive insights to optimize applications and operational resources



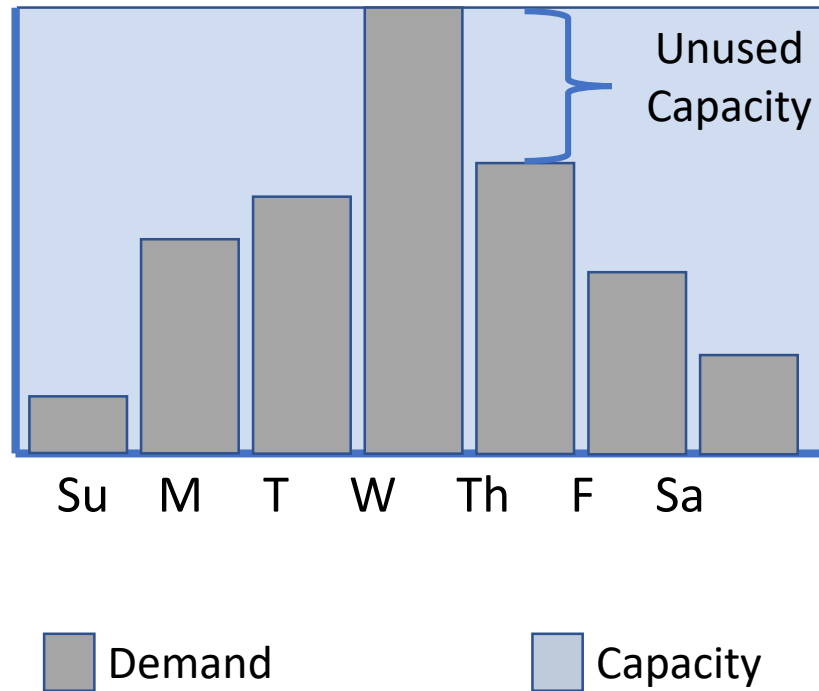
Pay as you go

Manage demand efficiently

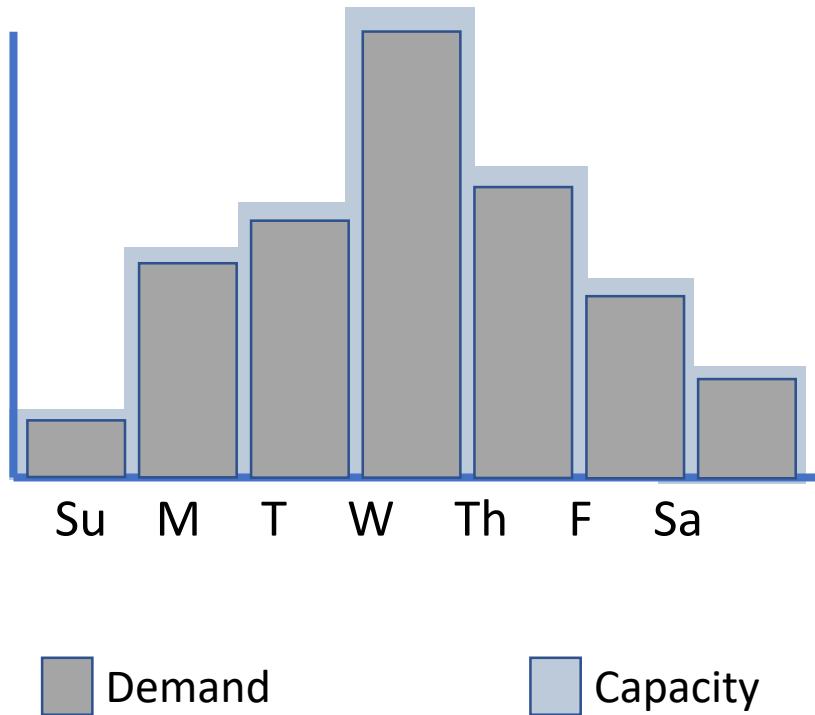
Why scaling matters



Why scaling matters



Why scaling matters



Amazon EC2 Auto Scaling adjusts capacity as needed

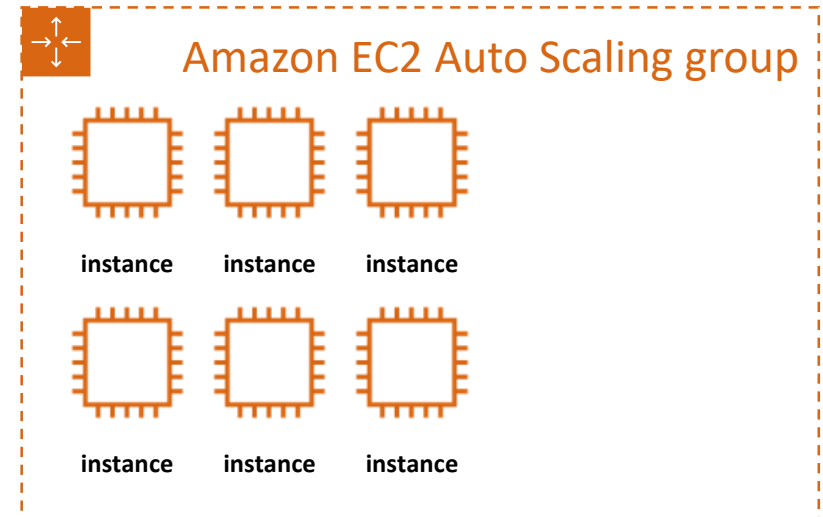
- Scale out for spikes
- Scale in during off-peak
- Replace unhealthy instances
- Pay only for what you use

Dynamic scaling with Amazon EC2 Auto Scaling

Follow the demand curve for your applications

- Select a load metric for your application
- Set as conditional and/or scheduled
- Use with CloudWatch, optionally

Max	10
Min	2
Desired	6



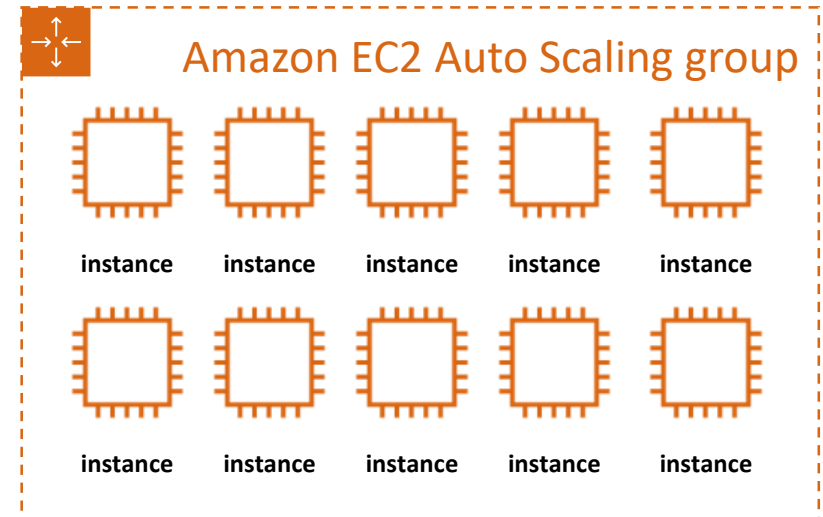
Average Demand

Dynamic scaling with Amazon EC2 Auto Scaling

Follow the demand curve for your applications

- Select a load metric for your application
- Set as conditional and/or scheduled
- Use with CloudWatch, optionally

Max	10
Min	2
Desired	10



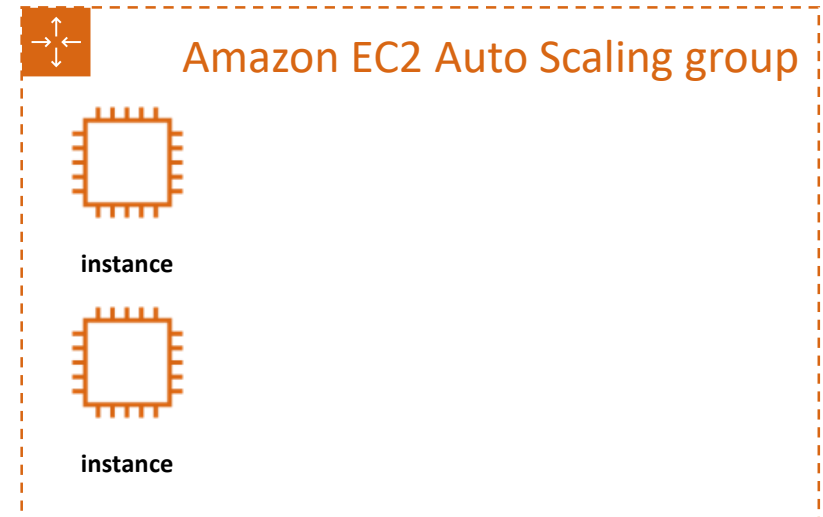
High Demand

Dynamic scaling with Amazon EC2 Auto Scaling

Follow the demand curve for your applications

- Select a load metric for your application
- Set as conditional and/or scheduled
- Use with CloudWatch, optionally

Max	10
Min	2
Desired	2



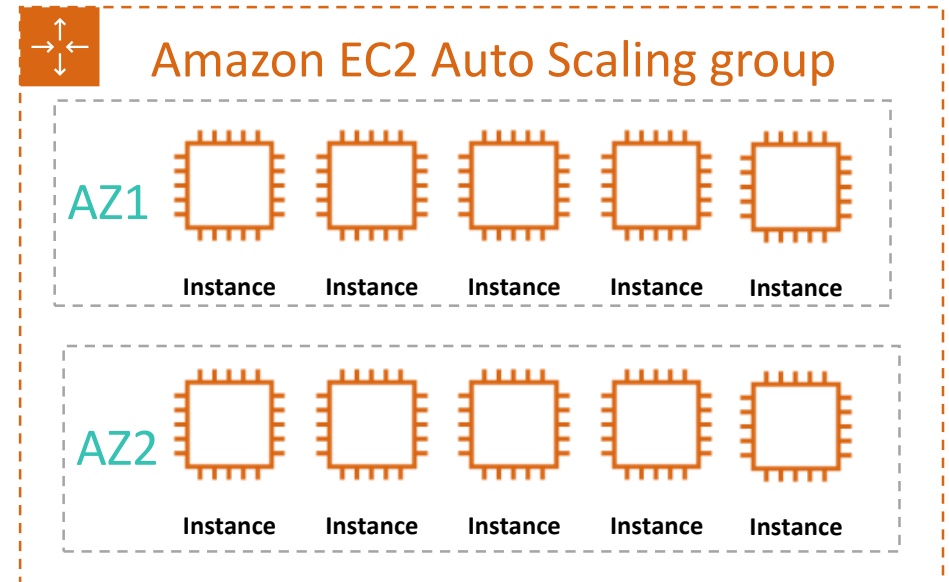
Low Demand

Fleet management with Amazon EC2 Auto Scaling

Replace impaired Amazon EC2 instances without intervention

- Monitor the health of running instances
- Replace impaired instances automatically
- Balance capacity across Availability Zones

Max	10
Min	2
Desired	10

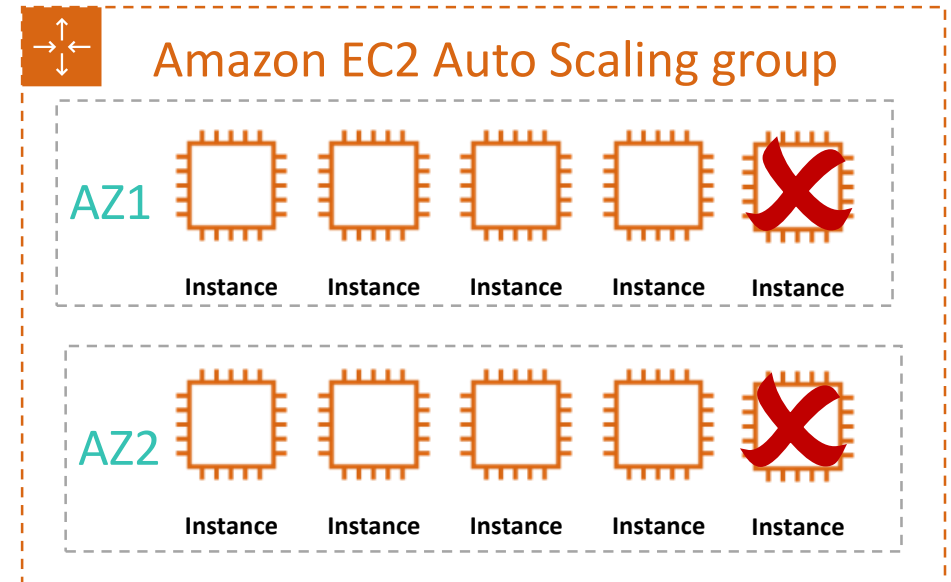


Fleet management with Amazon EC2 Auto Scaling

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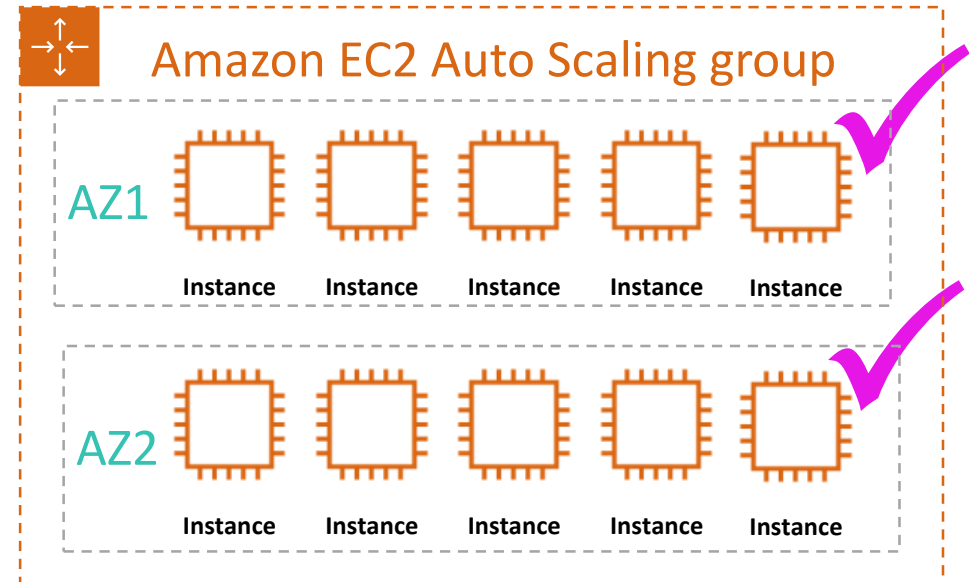


Fleet management with Amazon EC2 Auto Scaling

Replace impaired Amazon EC2 instances without intervention

- Monitor the health of running instances
- Replace impaired instances automatically
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Max	10
Min	2
Desired	10



Elastic Load Balancing

Automatically distribute traffic across multiple targets



High availability



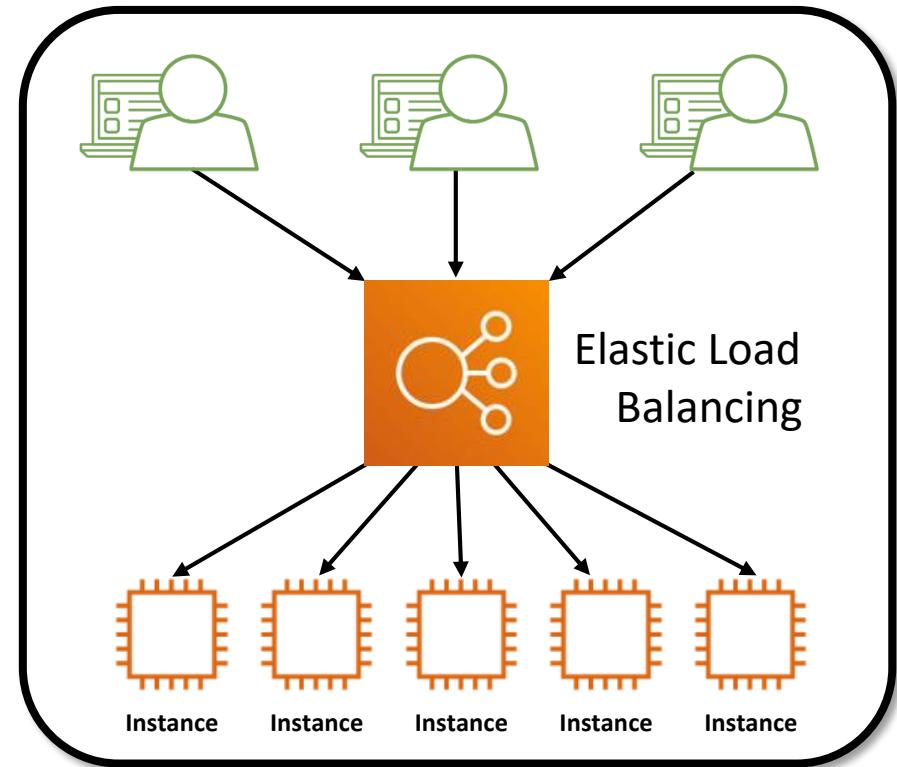
Health checks



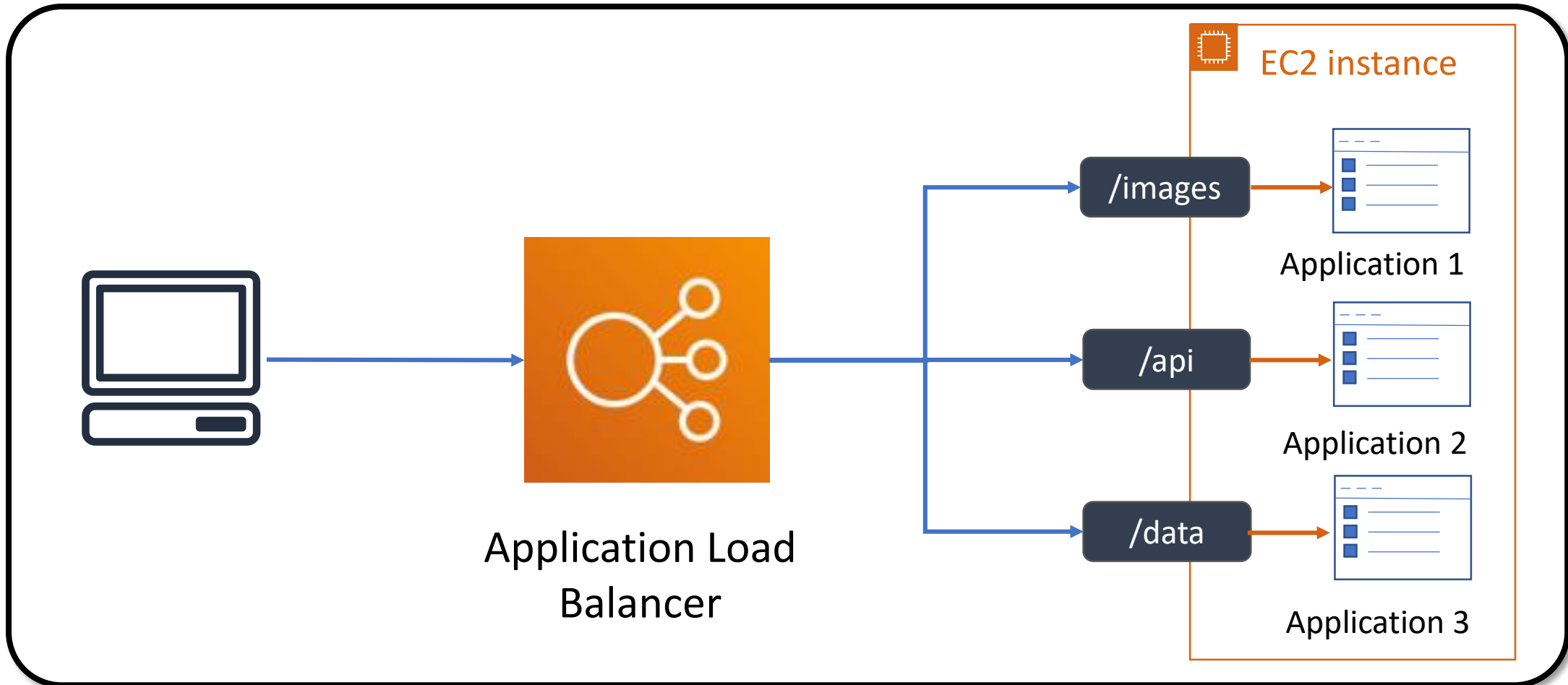
SSL/TLS termination



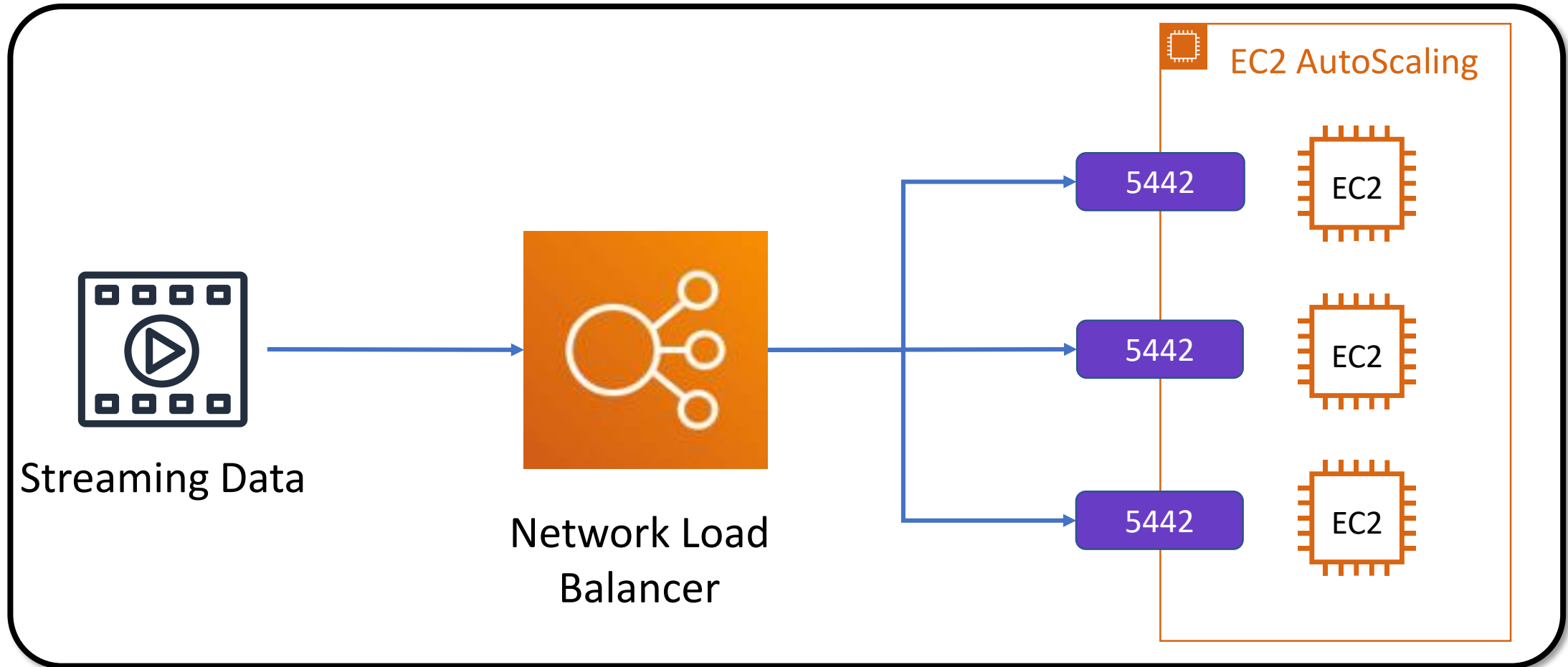
Operational monitoring



Application Load Balancer example

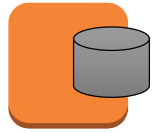


Network Load Balancer example



Deploy database services

DIY vs. AWS database services



Databases on Amazon EC2

- Operating system access
- Need features of specific application



AWS Database Services

- Easy to set up, manage, maintain
- Push-button high availability
- Focus on performance
- Managed infrastructure

What is Amazon Relational Database Service?

A database service that makes it easy to set up, operate, and scale a relational database in the cloud

Amazon RDS Engines

**Amazon
Aurora**



ORACLE®



- Easily scalable
- Automatic software patching
- Automated backups
- Database snapshots
- Multi-AZ deployments
- Automatic host replacement
- Encryption at rest and in transit

What is Amazon Aurora?



- Enterprise-class relational database
- MySQL- or PostgreSQL-compatible
- Up to 5X faster than standard MySQL databases
- Up to 3X faster than standard PostgreSQL databases
- Continuous backup to Amazon S3
- Up to 15 low-latency read replicas

What is Amazon DynamoDB?

Fast and flexible NoSQL database service for any scale

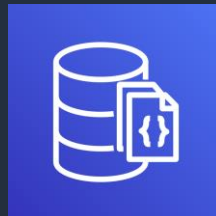


- Fully managed
- Low-latency queries
- Fine-grained access control
- Regional and global options

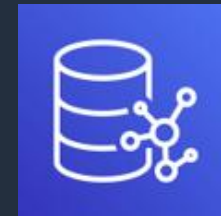
Other purpose-built database services



Amazon Redshift
Fast, scalable data warehouse



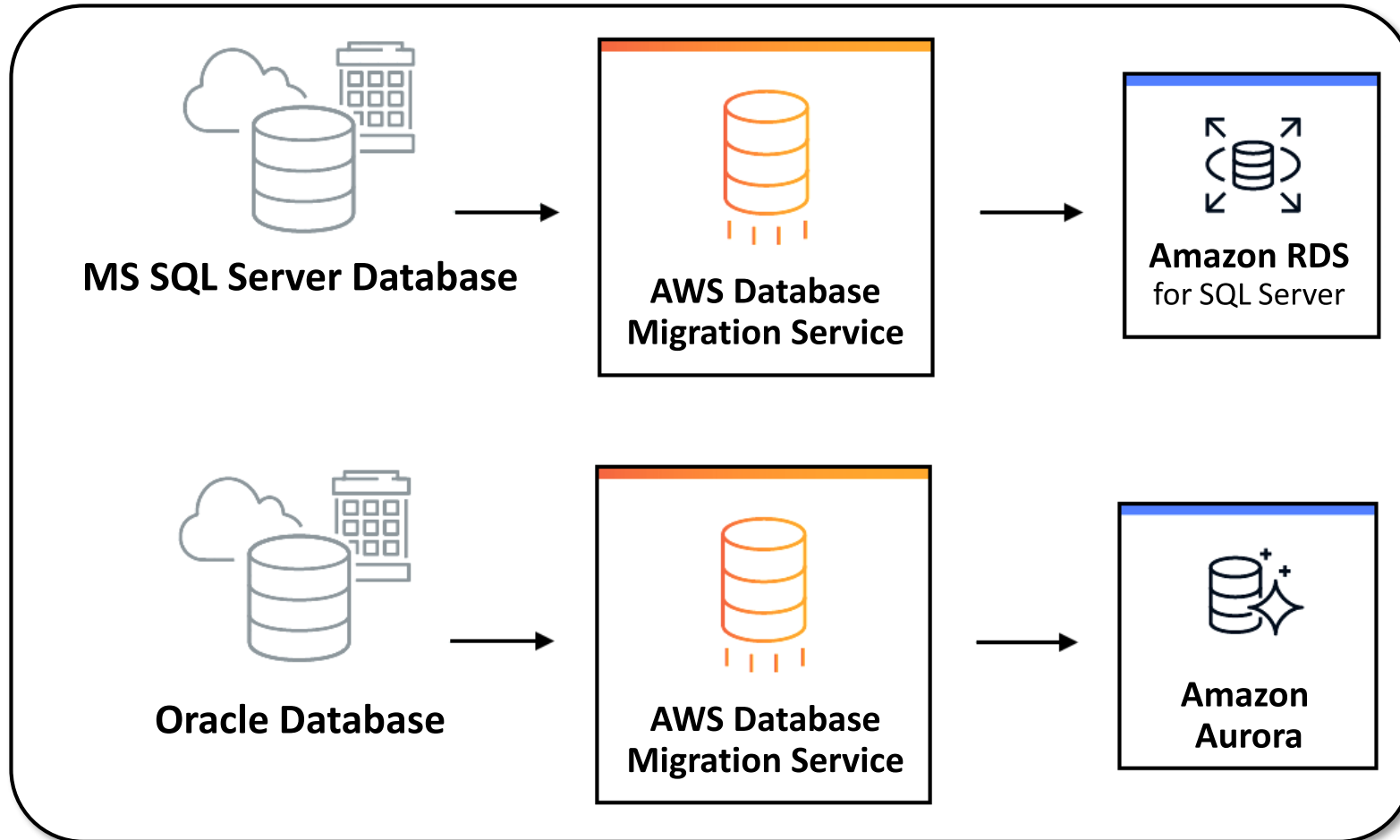
Amazon DocumentDB
MongoDB-compatible
database



Amazon Neptune
Graph database

What is AWS Database Migration Service?

Migrate databases to AWS quickly and securely



The right tool for the right job

What are my requirements?

Enterprise class relational database

Amazon Relational
Database Service
(Amazon RDS)

Fast and flexible NoSQL database service for any scale

Amazon DynamoDB

Operating system access or application features not supported by AWS database services

Databases on EC2

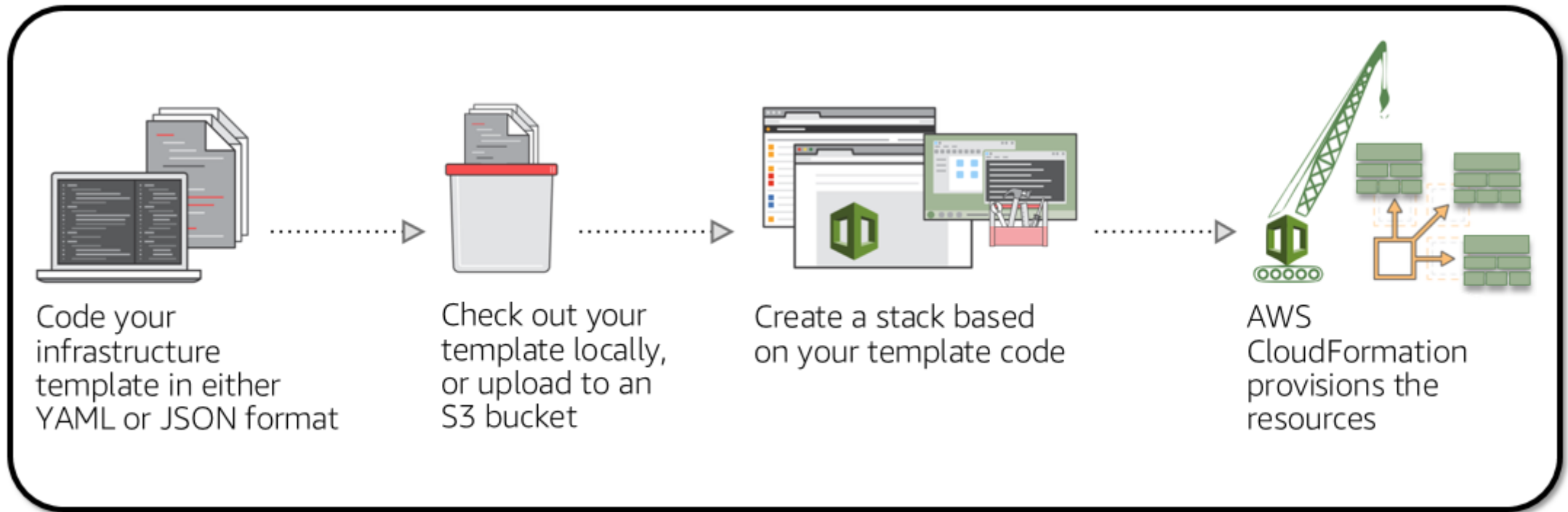
Specific case-driven requirements (Machine learning, data warehouse, graphs)

AWS purpose-built
database services

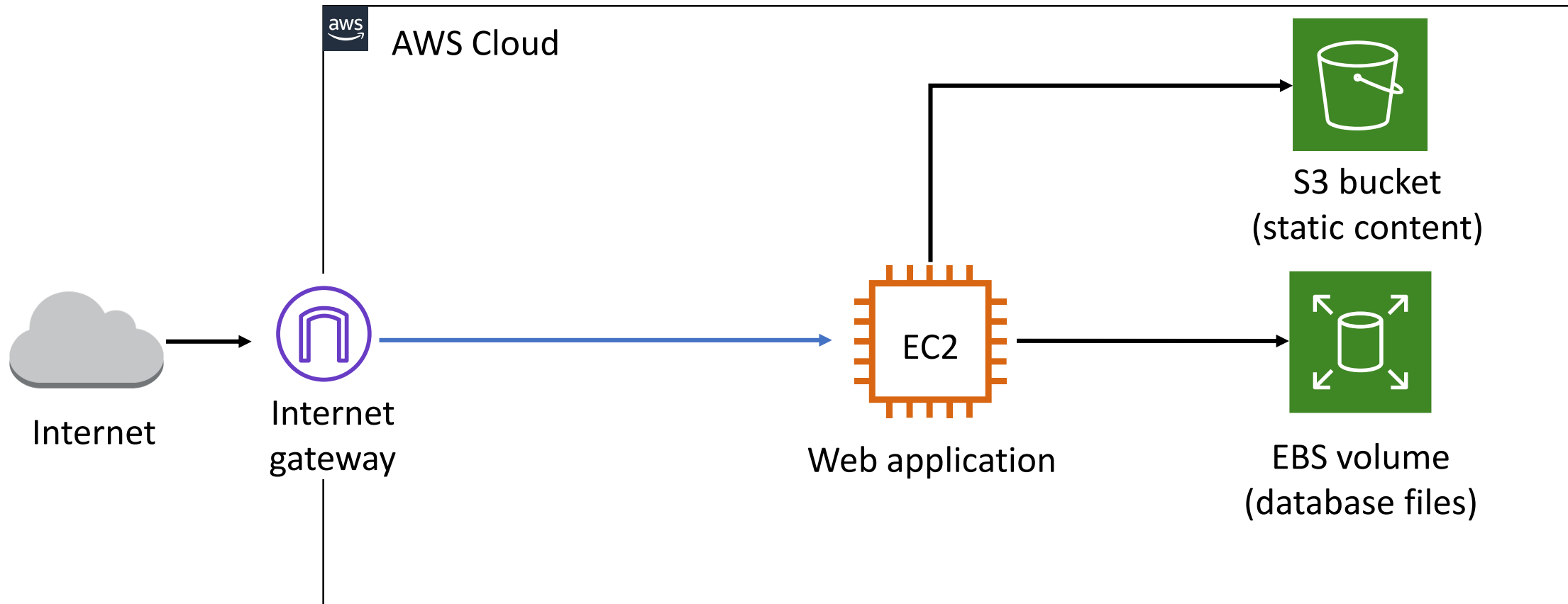
Automate deployment

What is AWS CloudFormation?

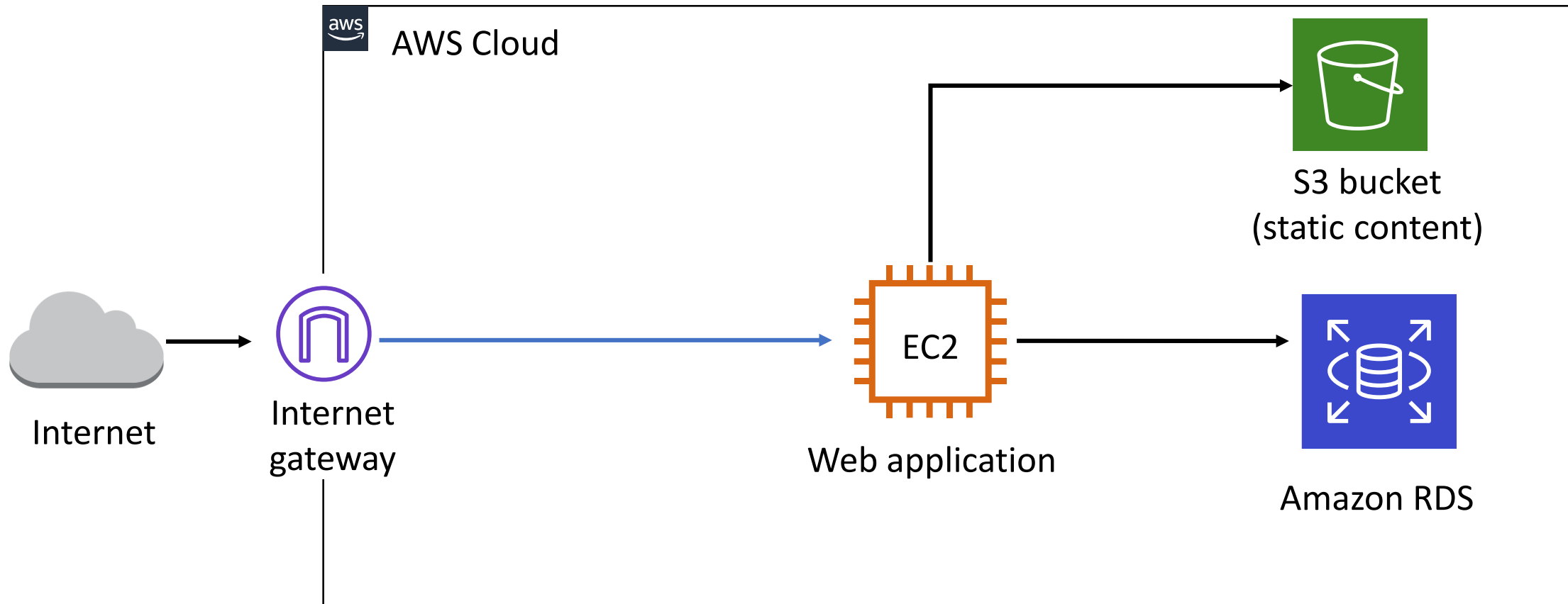
Model and provision all your cloud infrastructure resources



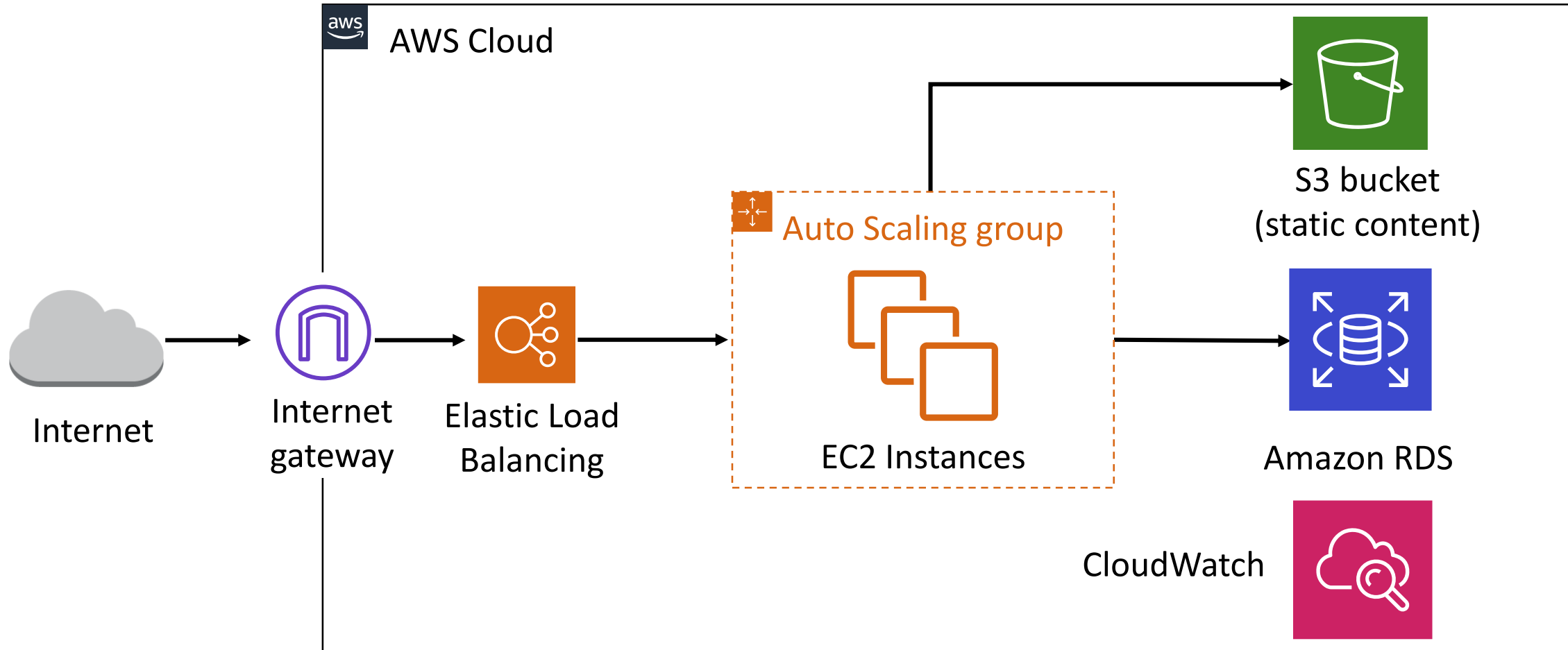
Putting it all together (1 of 4)



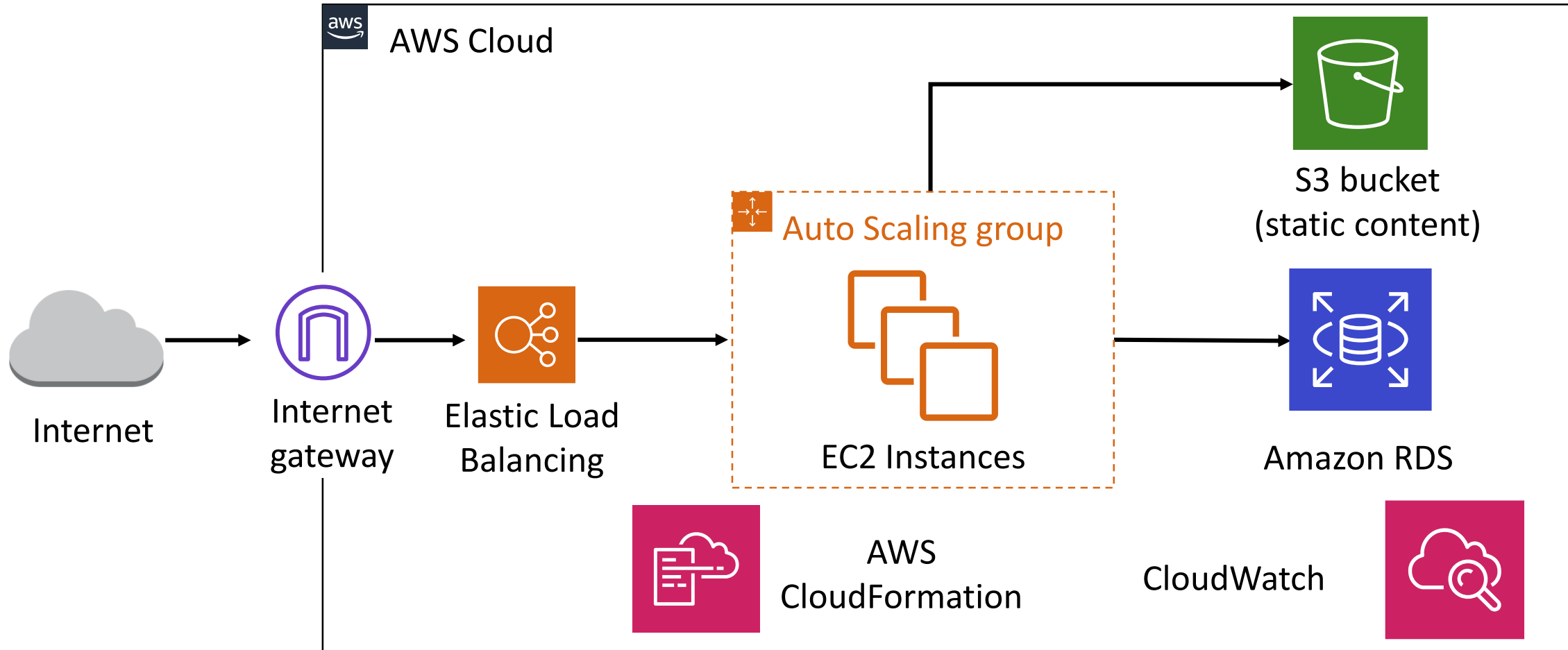
Putting it all together (2 of 4)



Putting it all together (3 of 4)



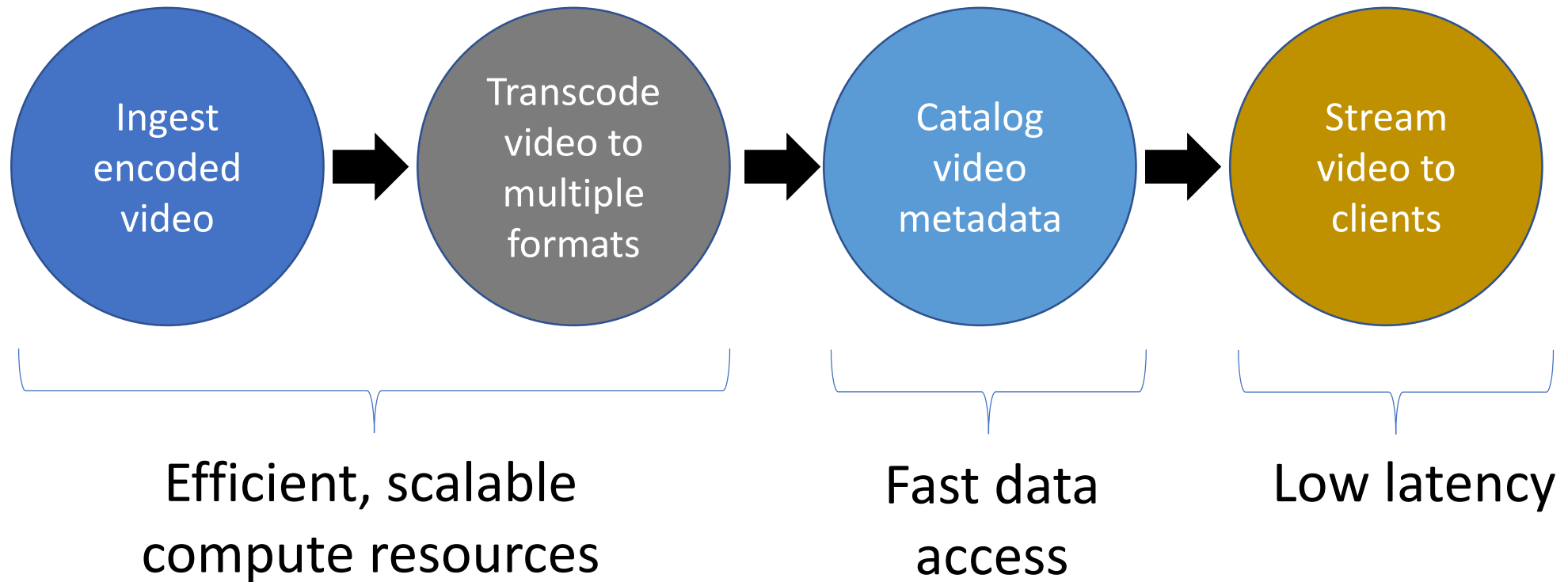
Putting it all together (4 of 4)



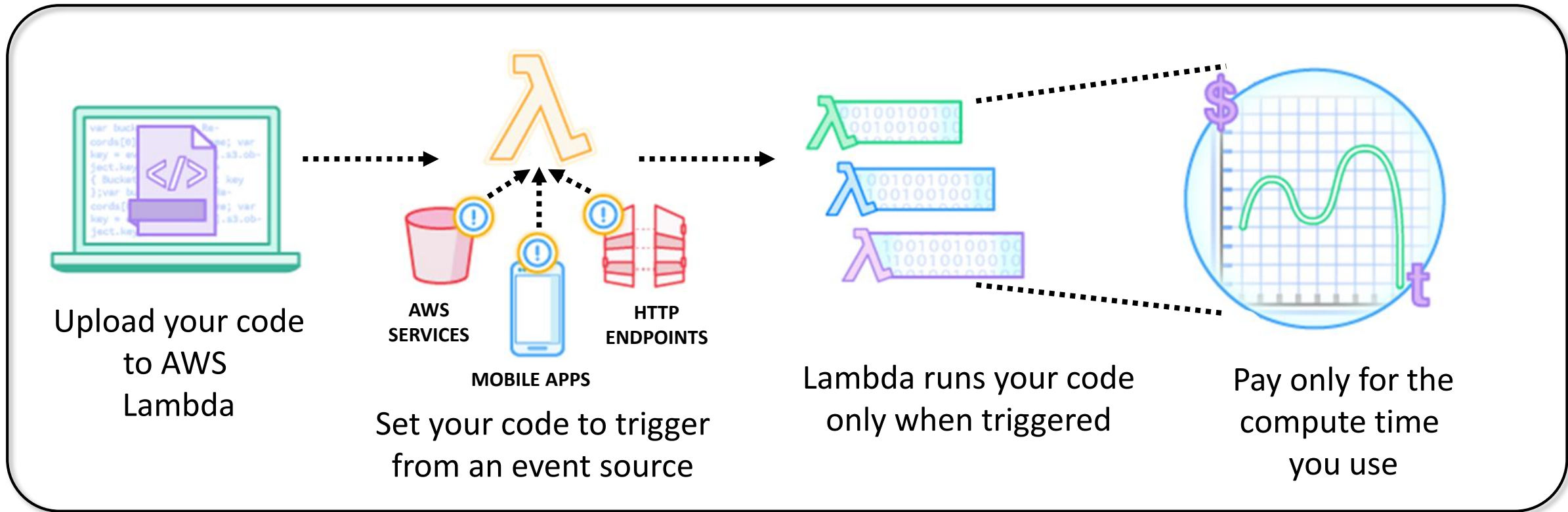
Deliver content faster

Challenge: Media streaming service

The architecture must meet the following requirements:



AWS Lambda: Run code without servers



Benefits of Lambda



Supports multiple programming languages



Completely automated administration



Built-in fault tolerance

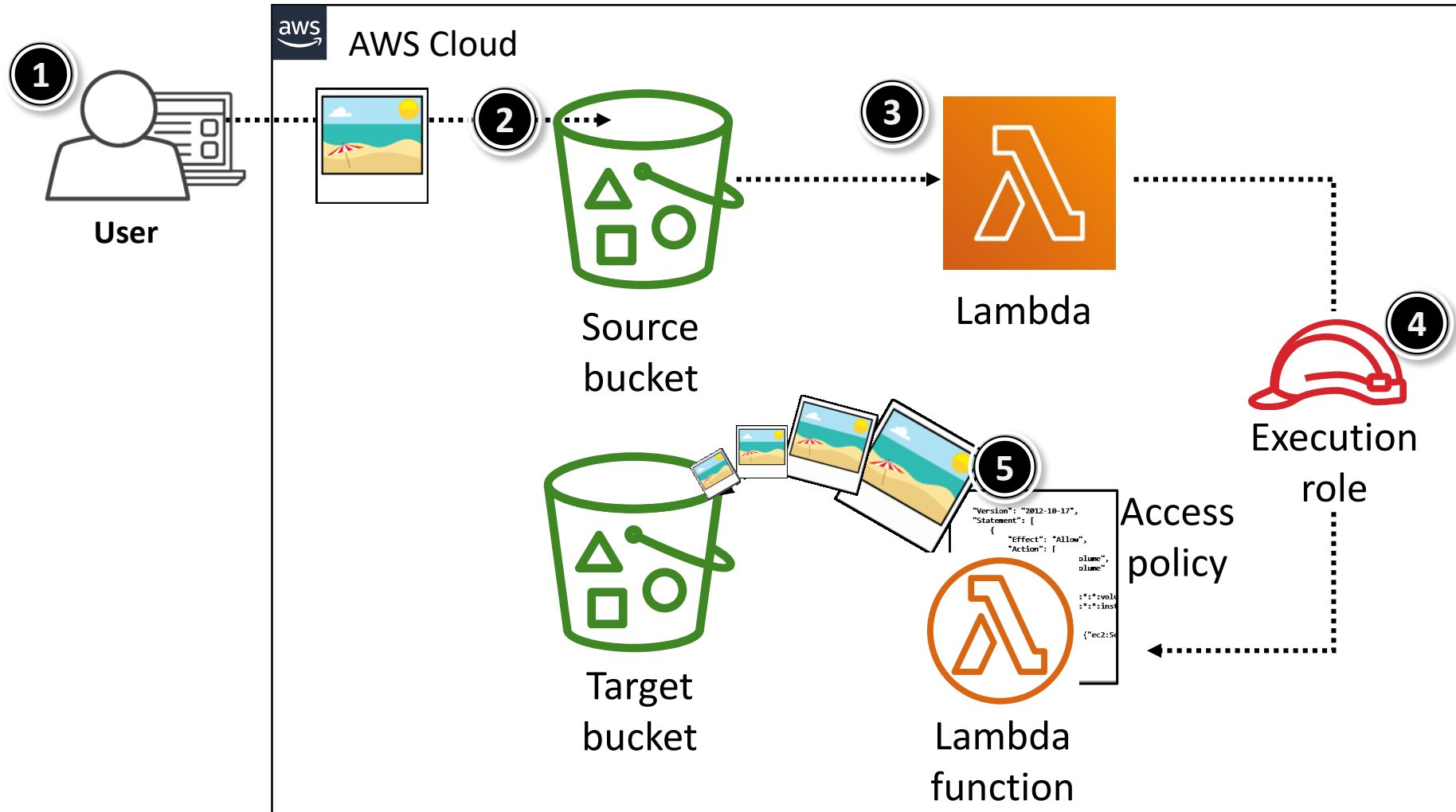


Supports orchestration of multiple functions



Pay per use pricing

Lambda example: create thumbnails

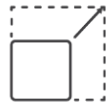


What is Amazon Simple Notification Service (Amazon SNS)?

Fully managed pub/sub messaging for distributed or serverless applications



Reliably deliver messages with durability



Automatically scale your workload

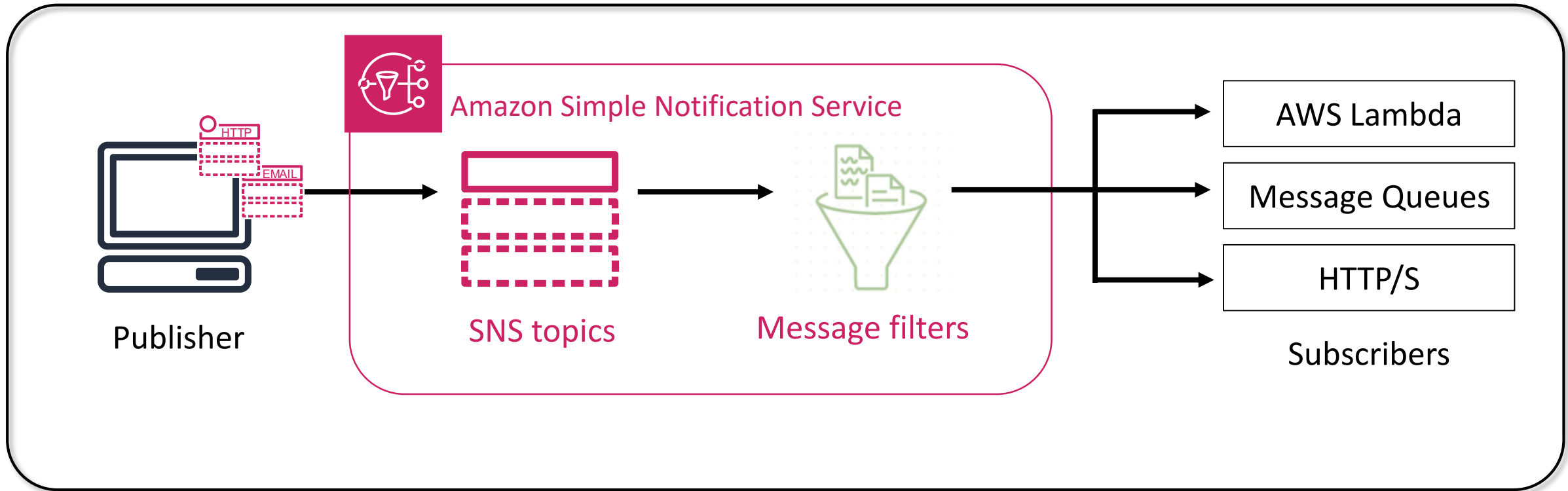


Simplify your architecture

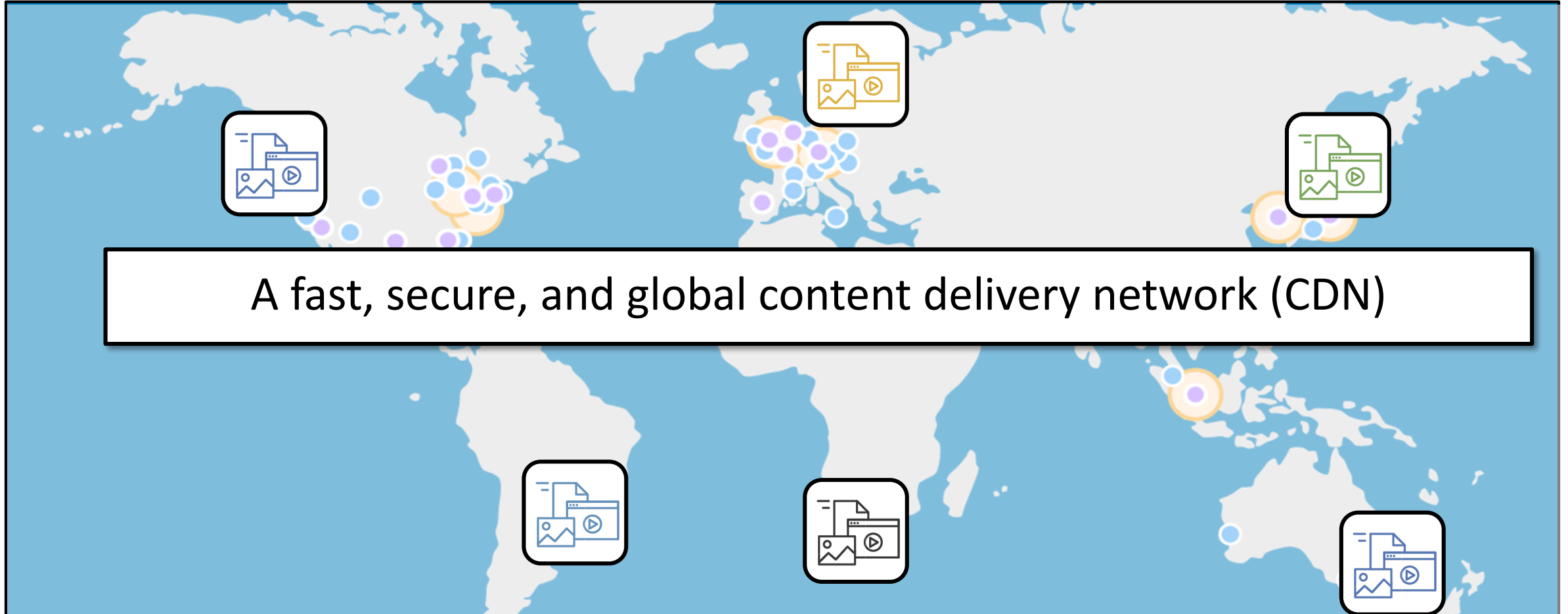


Keep messages private and secure

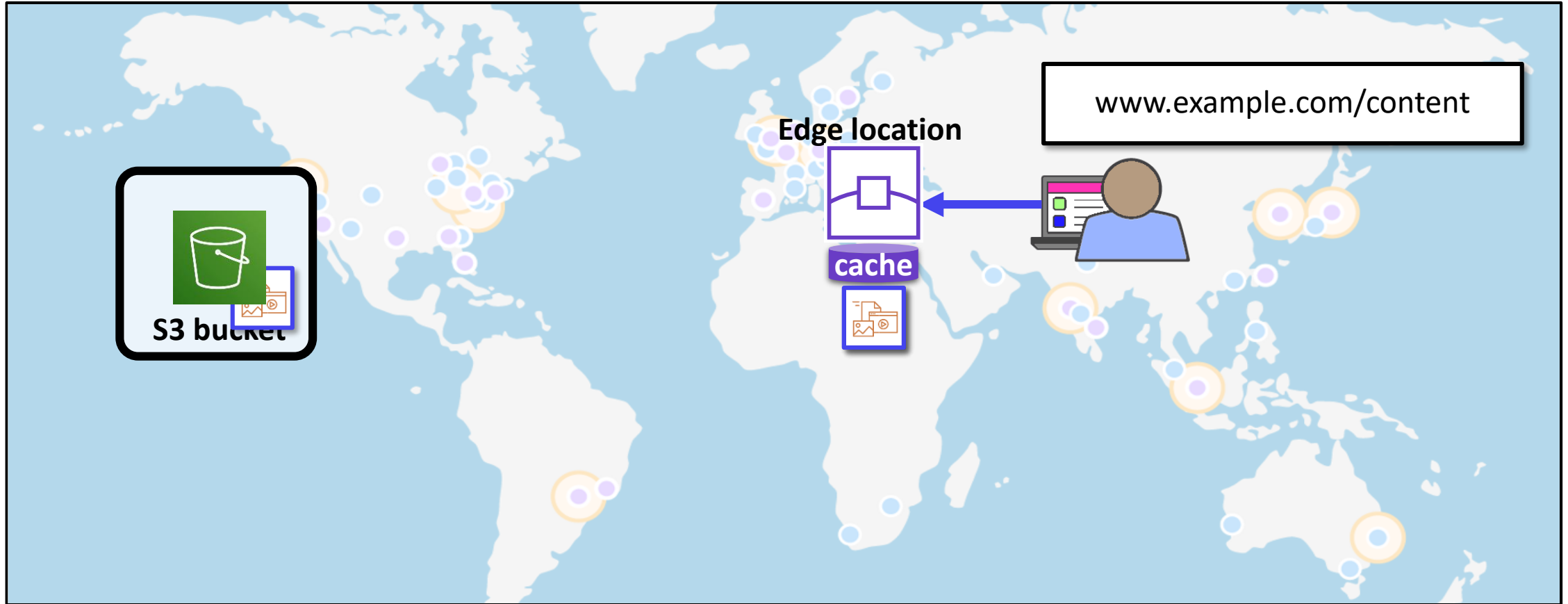
Amazon SNS overview



What is Amazon CloudFront?



How CloudFront delivers content to users



What is Amazon ElastiCache?

Fully managed Redis or Memcached-compatible in-memory data store



Extreme performance



Fully Managed



Scalable

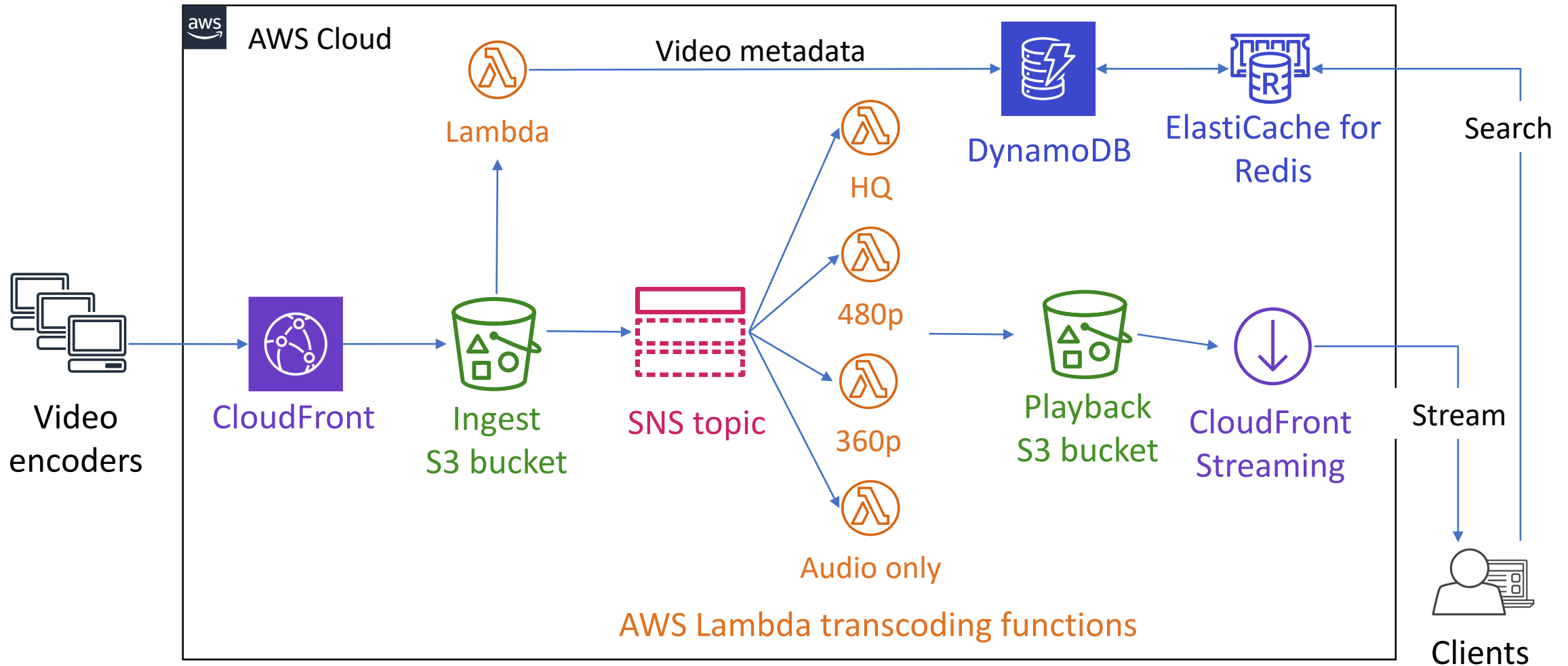


[Amazon ElastiCache for Redis](#)
Versatile in-memory data store



[Amazon ElastiCache for Memcached](#)
Scalable caching tier for data-intensive apps

Challenge: Media streaming service



Demo



! my-stack.yml ×



! my-stack.yml

```
1  AWSTemplateFormatVersion : "2010-09-09"
2
3  Resources:
4    MyFunction:
5      Type: AWS::Lambda::Function
6      Properties:
7        FunctionName: MyTestFunction
8        Description: Invoke a function during stack creation.
9        Handler: index.handler
10       Runtime: nodejs12.x
11       Code:
12         ZipFile: |
13           exports.handler = function(event, context, callback) {
14             console.log('Hello World')
15             callback(null);
16           }
17       Role: arn:aws:iam::144824907653:role/lambda-role
18
19
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

1: bash



demo-aws-spanish-module3 \$



1



Key Takeaways

Amazon CloudWatch	Have complete visibility of your cloud resources and applications
Elastic Load Balancing Application Auto Scaling	Deploy highly available applications that scale with demand
AWS Database Services	Run SQL or NoSQL databases without the management overhead
AWS CloudFormation	Programmatically deploy repeatable infrastructure
AWS Lambda	Run code without managing servers
Amazon CloudFront	Deliver your content across a massively scaled and globally available network

End of Module 3

Test Your Knowledge

Thank you!

 #AWSomeDay