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EE4500

# Module 3: AWS Global Infrastructure Overview

## AWS Academy Cloud Foundations

# Module overview

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## Topics

- AWS Global Infrastructure
- AWS service and service category overview

## Demo

- AWS Global Infrastructure

## Activities

- AWS Management Console clickthrough



**Knowledge check**

# Module objectives

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After completing this module, you should be able to:

- Identify the difference between AWS Regions, Availability Zones, and edge locations
- Identify AWS service and service categories

# Section 1: AWS Global Infrastructure

## Module 3: AWS Global Infrastructure Overview

# AWS Global Infrastructure

- The **AWS Global Infrastructure** is designed and built to deliver a **flexible, reliable, scalable**, and **secure** cloud computing environment with high-quality **global network performance**.
- AWS continually updates its global infrastructure footprint. Visit one of the following web pages for current infrastructure information:

- **AWS Global Infrastructure Map:**  
[https://aws.amazon.com/about-aws/global-infrastructure/#AWS\\_Global\\_Infrastructure\\_Map](https://aws.amazon.com/about-aws/global-infrastructure/#AWS_Global_Infrastructure_Map)  
Choose a circle on the map to view summary information about the Region represented by the circle.
- **Regions and Availability Zones:**  
[https://aws.amazon.com/about-aws/global-infrastructure/regions\\_az/](https://aws.amazon.com/about-aws/global-infrastructure/regions_az/)  
Choose a tab to view a map of the selected geography and a list of Regions, Edge locations, Local zones, and Regional Caches.



# AWS Regions

- An **AWS Region** is a geographical area.
  - **Data replication** across Regions is controlled by you.
  - **Communication** between Regions uses AWS backbone network infrastructure.
- Each Region provides full redundancy and connectivity to the network.
- A Region typically consists of two or more **Availability Zones**.



Example: London Region

# Selecting a Region

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Determine the right Region for your services, applications, and data based on these factors



Data governance, legal requirements



Proximity to customers (latency)



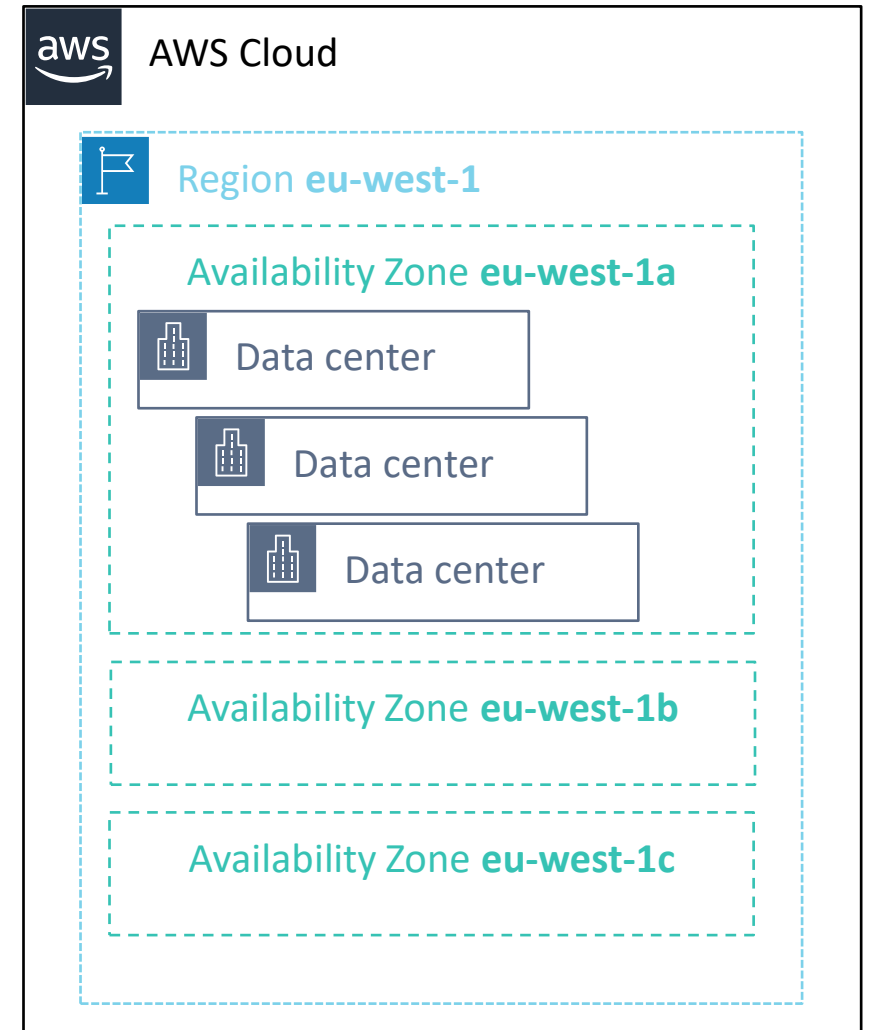
Services available within the Region



Costs (vary by Region)

# Availability Zones

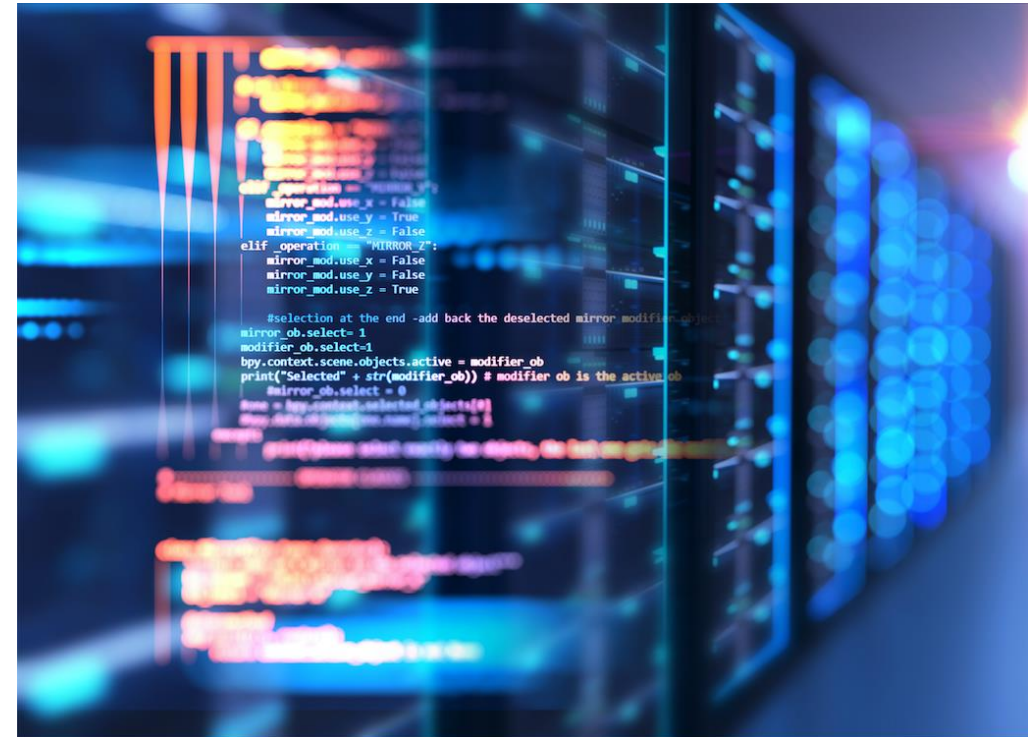
- Each **Region** has multiple Availability Zones.
- Each **Availability Zone** is a fully isolated partition of the AWS infrastructure.
  - Availability Zones consist of discrete **data centers**
  - They are designed for fault isolation
  - They are interconnected with other Availability Zones by using high-speed private networking
  - You choose your Availability Zones.
  - **AWS recommends replicating data and resources across Availability Zones** for resiliency.





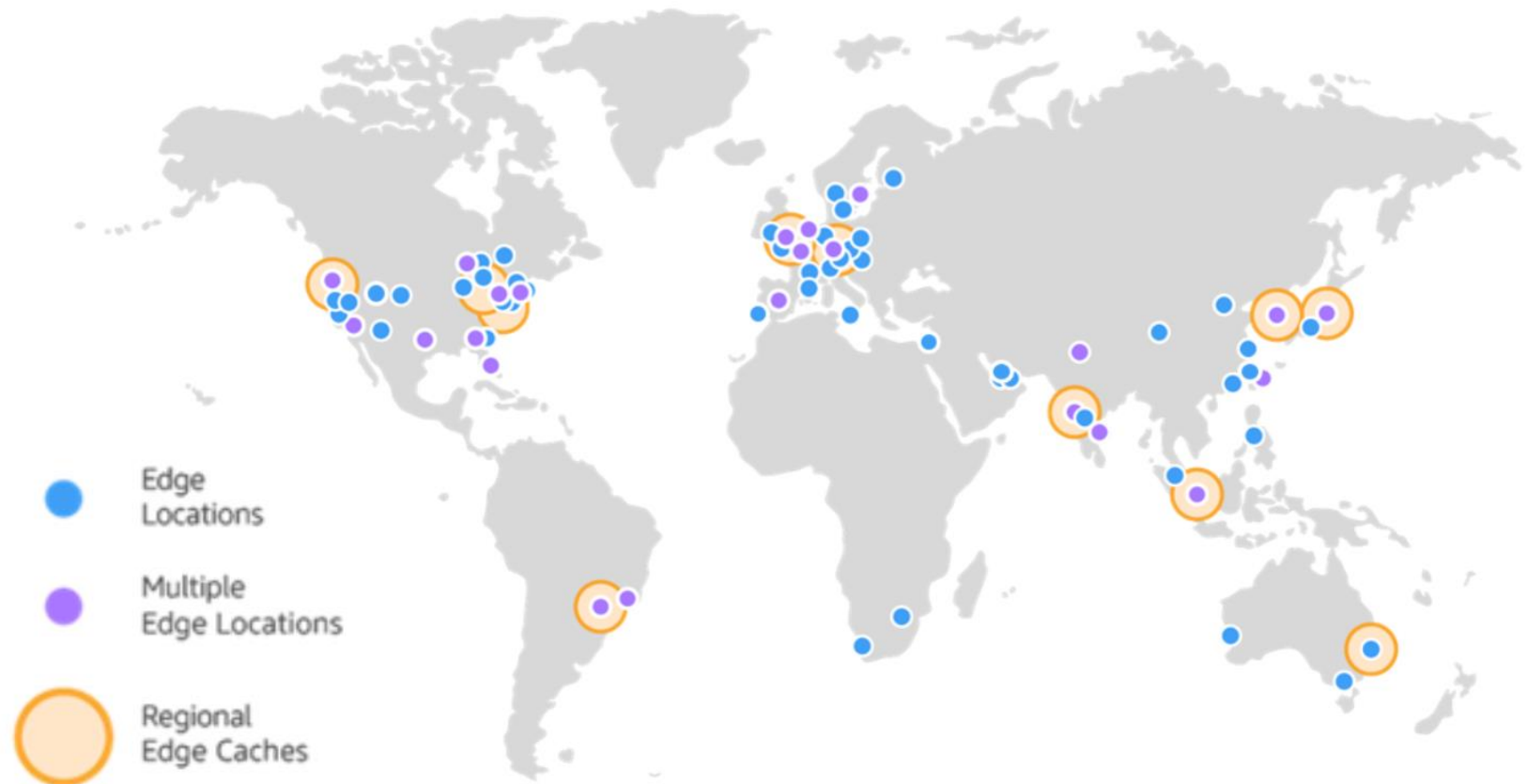
# AWS data centers

- AWS data centers are designed for security.
- Data centers are where the data resides and data processing occurs.
- Each data center has redundant power, networking, and connectivity, and is housed in a separate facility.
- A data center typically has 50,000 to 80,000 physical servers.



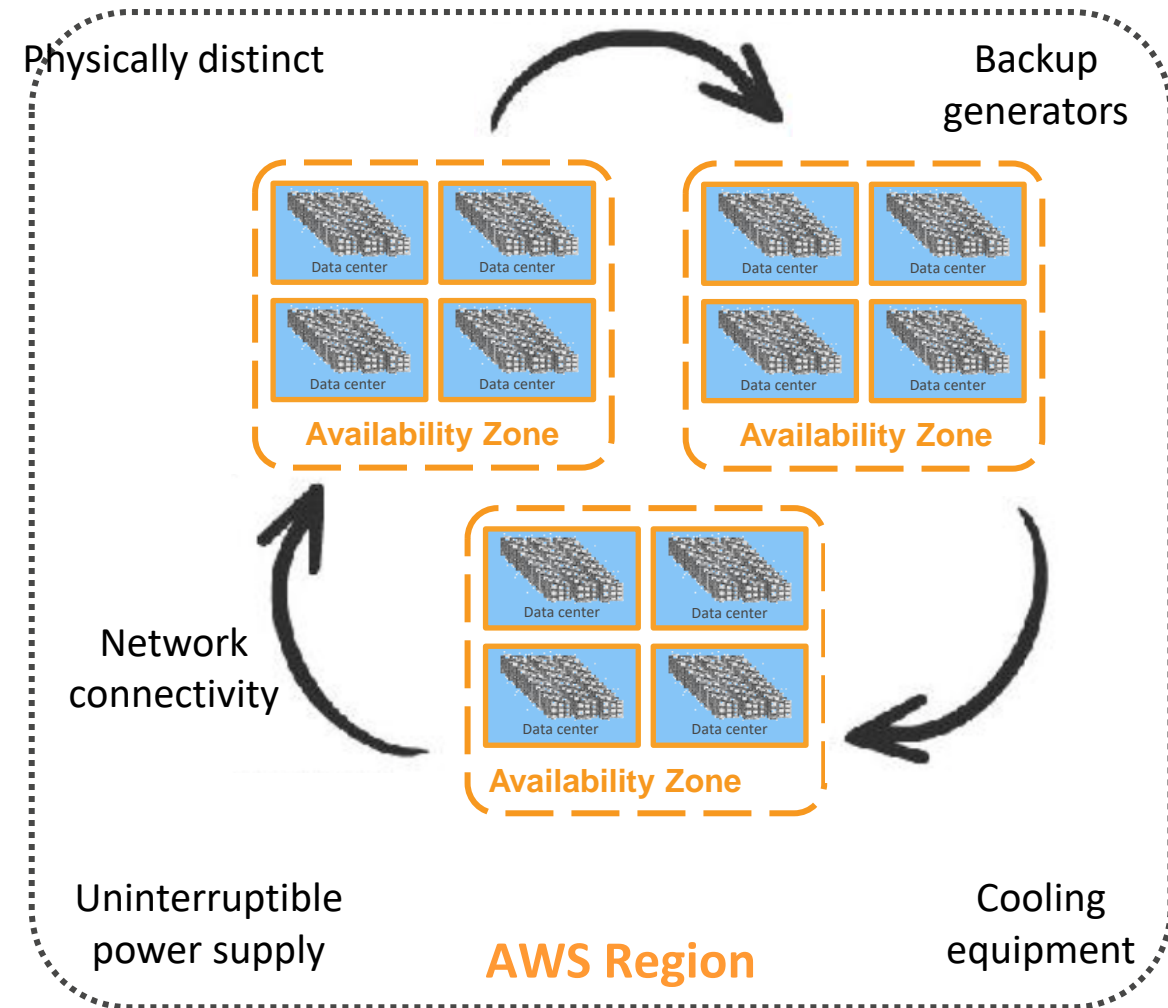
# Points of Presence

- AWS provides a global network of **Points of Presence** locations
- Consists of **edge locations** and a much smaller number of **Regional edge caches**
- Used with Amazon CloudFront
  - A global Content Delivery Network (CDN), that delivers content to end users with **reduced latency**
- Regional edge caches used for content with infrequent access.



# AWS infrastructure features

- Elasticity and scalability
  - Elastic infrastructure; dynamic adaption of capacity
  - Scalable infrastructure; adapts to accommodate growth
- Fault-tolerance
  - Continues operating properly in the presence of a failure
  - Built-in redundancy of components
- High availability
  - High level of operational performance
  - Minimized downtime
  - No human intervention



# Key takeaways



- The **AWS Global Infrastructure** consists of **Regions** and **Availability Zones**.
- Your choice of a **Region** is typically based on **compliance requirements** or to **reduce latency**.
- Each **Availability Zone** is physically separate from other Availability Zones and has redundant power, networking, and connectivity.
- **Edge locations**, and **Regional edge caches** improve performance by **caching** content closer to users.

# Section 2: AWS services and service category overview

## Module 3: AWS Global Infrastructure Overview

# AWS foundational services

## Applications



Virtual desktops



Collaboration and sharing

## Platform Services

### Databases

Relational

NoSQL

Caching

### Analytics

computing

Real-time

Data  
warehouse

Data  
workflows

### Application services

Queuing

Orchestration

App Streaming

Transcoding

Email

Search

### Deployment and management

Containers

DevOps tools

Resource templates

Usage tracking

Monitoring and logs

### Mobile Services

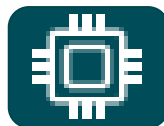
Identity

Sync

Mobile  
Analytics

Notifications

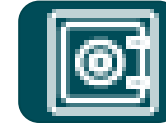
## Foundation Services



Compute (virtual, automatic scaling, and load balancing)



Networking



Storage (object, block, and archive)

## Infrastructure

Regions

Availability Zones



Edge locations



# AWS categories of services



Analytics



Application  
Integration



AR and VR



Blockchain



Business  
Applications



Compute



Cost  
Management



Customer  
Engagement



Database



Developer Tools



End User  
Computing



Game Tech



Internet  
of Things



Machine  
Learning



Management and  
Governance



Media Services



Migration and  
Transfer



Mobile



Networking and  
Content Delivery



Robotics



Satellite



Security, Identity, and  
Compliance



Storage

# Storage service category



Photo from <https://www.pexels.com/photo/black-and-grey-device-159282/>



## AWS storage services



Amazon Simple Storage Service (Amazon S3)



Amazon Elastic Block Store (Amazon EBS)



Amazon Elastic File System (Amazon EFS)



Amazon Simple Storage Service Glacier



# Compute service category

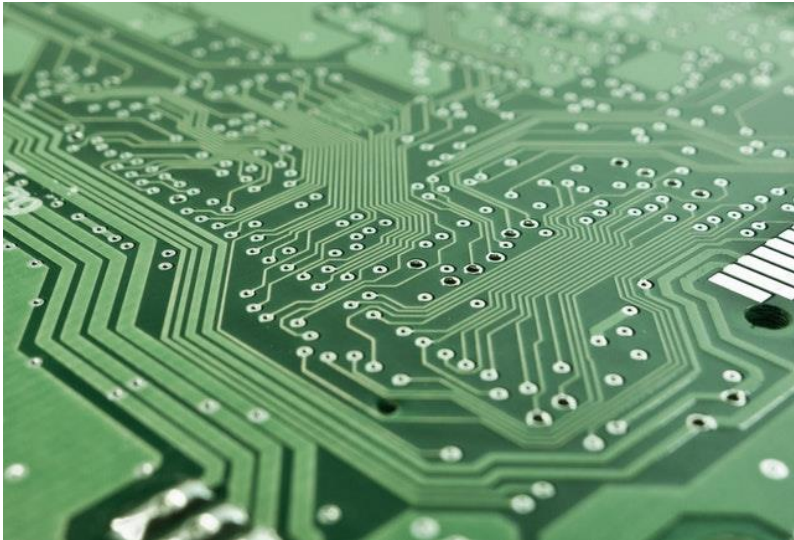
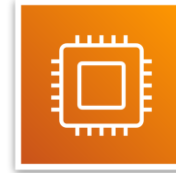
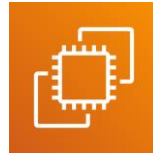


Photo from <https://www.pexels.com/photo/technology-computer-lines-board-50711/>



## AWS Compute services



Amazon EC2



Amazon EC2  
Auto Scaling



Amazon Elastic  
Container Service  
(Amazon ECS)



Amazon EC2  
Container Registry



AWS Elastic  
Beanstalk



AWS Lambda



Amazon Elastic  
Kubernetes Service  
(Amazon EKS)



AWS Fargate

# Database service category

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Photo from <https://aws.amazon.com/compliance/data-center/data-centers/>



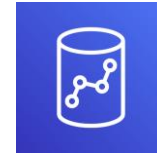
## AWS Database services



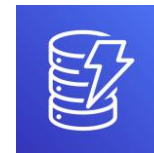
Amazon Relational  
Database Service



Amazon Aurora



Amazon Redshift

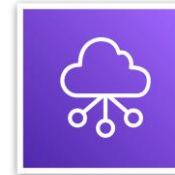


Amazon  
DynamoDB

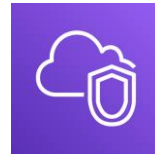
# Networking and content delivery service category



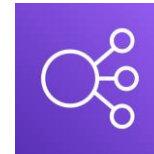
Photo by Umberto on Unsplash



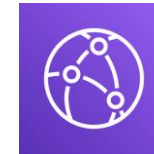
**AWS networking  
and content delivery services**



Amazon VPC



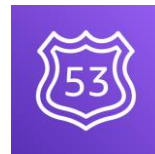
Elastic Load  
Balancing



Amazon  
CloudFront



AWS Transit  
Gateway



Amazon  
Route 53



AWS Direct  
Connect



AWS VPN

# Security, identity, and compliance service category

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Photo by Paweł Czerwiński on Unsplash



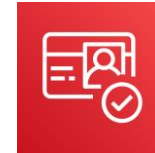
**AWS security, identity,  
and compliance services**



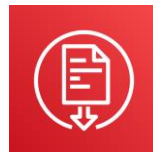
AWS Identity and Access  
Management (IAM)



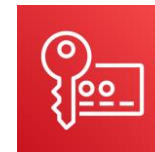
AWS  
Organizations



Amazon Cognito



AWS Artifact



AWS Key  
Management  
Service



AWS Shield

# AWS cost management service category

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Photo by Alexander Mills on Unsplash



**AWS cost management**  
services



AWS Cost and  
Usage Report



AWS Budgets



AWS Cost  
Explorer



# Management and governance service category

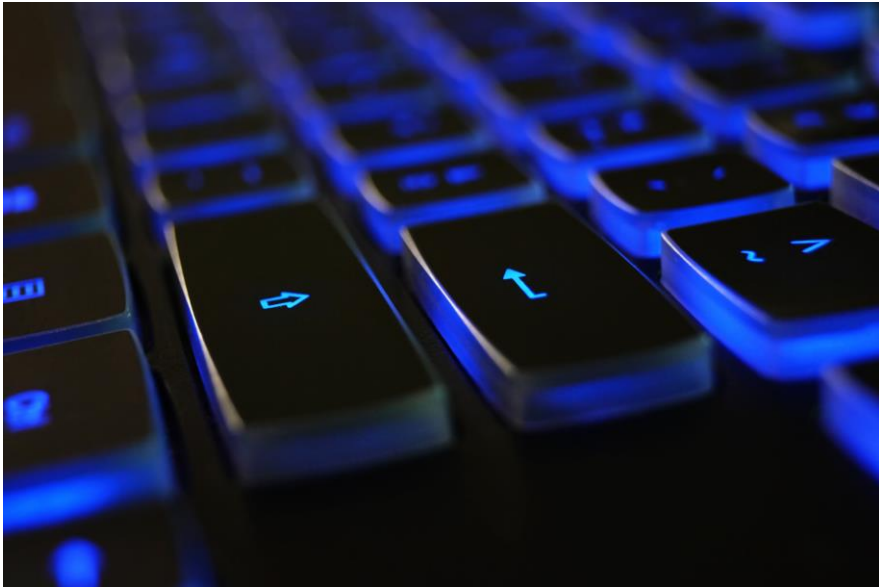
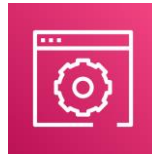


Photo by Marta Branco from Pexels



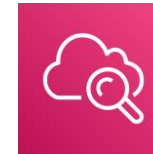
## AWS management and governance services



AWS Management Console



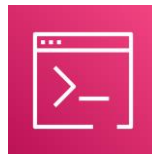
AWS Config



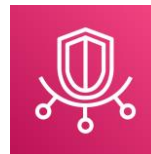
Amazon CloudWatch



AWS Auto Scaling



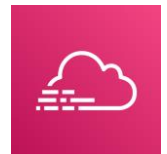
AWS Command Line Interface



AWS Trusted Advisor



AWS Well-Architected Tool



AWS CloudTrail

# Activity: AWS Management Console clickthrough



Photo by Pixabay from Pexels.

# Hands-on activity: AWS Management Console clickthrough

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1. Launch the [Sandbox](#) hands-on environment and connect to the [AWS Management Console](#).
2. Explore the AWS Management Console.
  - A. Click the **Services** menu.
  - B. Notice how services are grouped into service categories. For example, the **EC2** service appears in the **Compute** service category.

[Question #1](#): Under which service category does the **IAM** service appear?

[Question #2](#): Under which service category does the **Amazon VPC** service appear?
  - C. Click the **Amazon VPC** service. Notice that the dropdown menu in the top-right corner displays an AWS Region (for example, it might display *N. Virginia*).
  - D. Click the Region menu and switch to a different Region. For example, choose **EU (London)**.
  - E. Click **Subnets** (on the left side of the screen). The Region has three subnets in it. Click the box next to one of the subnets. Notice that the bottom half of the screen now displays details about this subnet.

[Question #3](#): Does the subnet you selected exist at the level of the Region or at the level of the Availability Zone?
  - F. Click **Your VPCs**. An existing VPC is already selected.

[Question #4](#): Does the VPC exist at the level of the Region or the level of the Availability Zone?

[Question #5](#): Which services are global instead of Regional? Check Amazon EC2, IAM, Lambda, and Route 53.



# Activity answer key

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- **Question #1:** Under which service category does the **IAM** service appear?
  - **Answer:** **Security, Identity, & Compliance.**
- **Question #2:** Under which service category does the **Amazon VPC** service appear?
  - **Answer:** **Networking & Content Delivery**
- **Question #3:** Does the subnet that you selected exist at the level of the Region or the level of the Availability Zone?
  - **Answer:** Subnets exist at the **level of the Availability Zone.**
- **Question #4:** Does the VPC exist at the level of the Region or the level of the Availability Zone?
  - **Answer:** VPCs exist at the **Region level.**
- **Question #5:** Which of the following services are global instead of Regional? Check Amazon EC2, IAM, Lambda, and Route 53.
  - **Answer:** **IAM and Route 53 are global.** Amazon EC2 and Lambda are Regional.

# Module wrap-up

## Module 3: AWS Global Infrastructure Overview

# Module summary

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In summary, in this module you learned how to:

- Identify the difference between AWS Regions, Availability Zones, and edge locations
- Identify AWS service and service categories

# Complete the knowledge check



# Sample exam question

Which component of AWS global infrastructure does Amazon CloudFront use to ensure low-latency delivery?

Choice	Response
A	AWS Regions
B	AWS edge locations
C	AWS Availability Zones
D	Amazon Virtual Private Cloud (Amazon VPC)

# Sample exam question answer



Which component of AWS global infrastructure does Amazon CloudFront use to ensure low-latency delivery?

The correct answer is B.

The keywords in the question are component of AWS global infrastructure, CloudFront, low-latency.

# Additional resources

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- AWS Global Infrastructure: <https://aws.amazon.com/about-aws/global-infrastructure/>
- AWS Regional Services List: <https://aws.amazon.com/about-aws/global-infrastructure/regional-product-services/>
- AWS Cloud Products: <https://aws.amazon.com/products/>

# Thank you

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