

AWS Academy Cloud Foundations

Module 3: AWS Global Infrastructure Overview



Topics

- AWS Global Infrastructure
- AWS service and service category overview

Demo

- AWS Global Infrastructure

Activities

- AWS Management Console clickthrough



Knowledge check

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

Module 3: AWS Global Infrastructure Overview

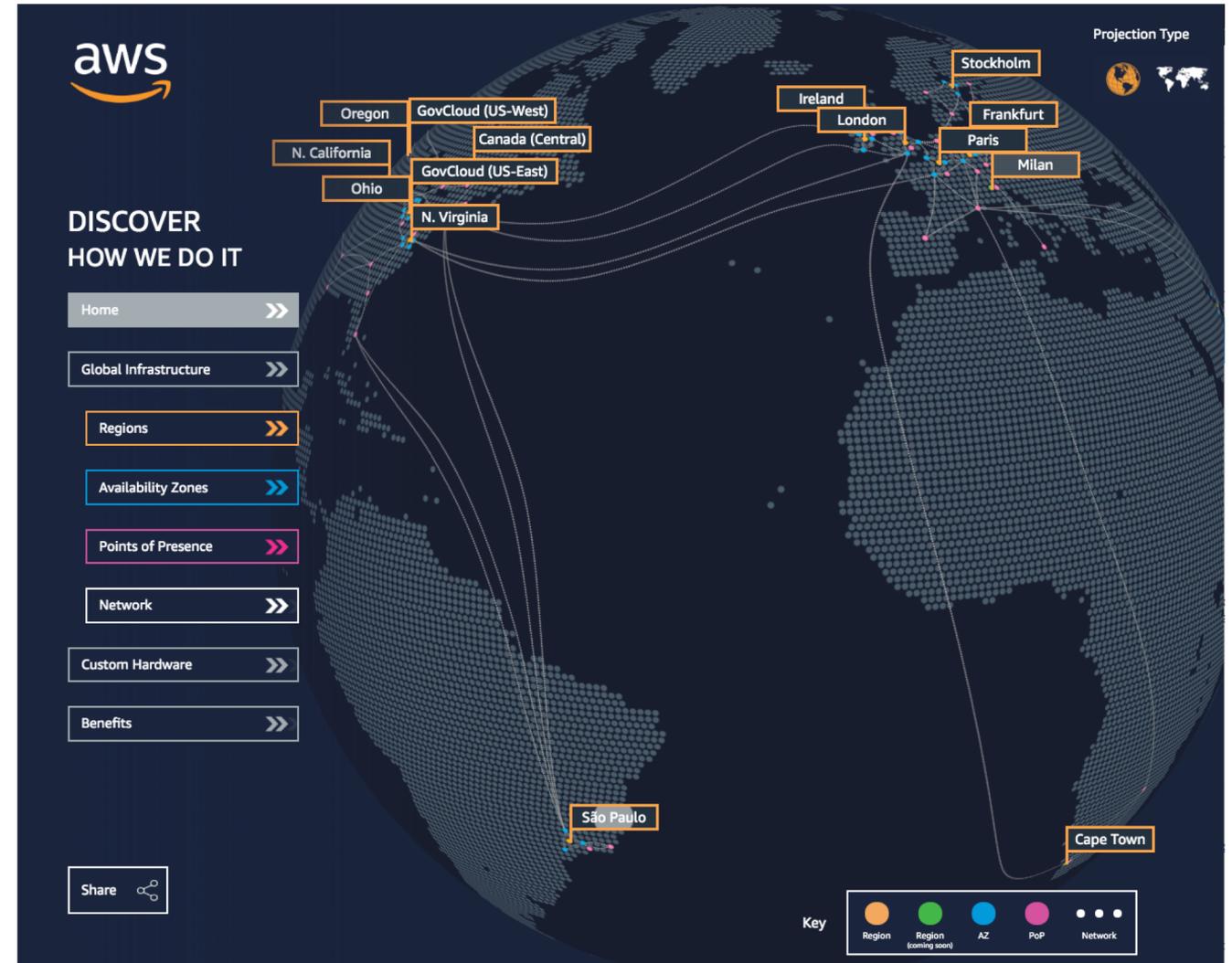
Section 1: AWS Global Infrastructure

AWS Global Infrastructure

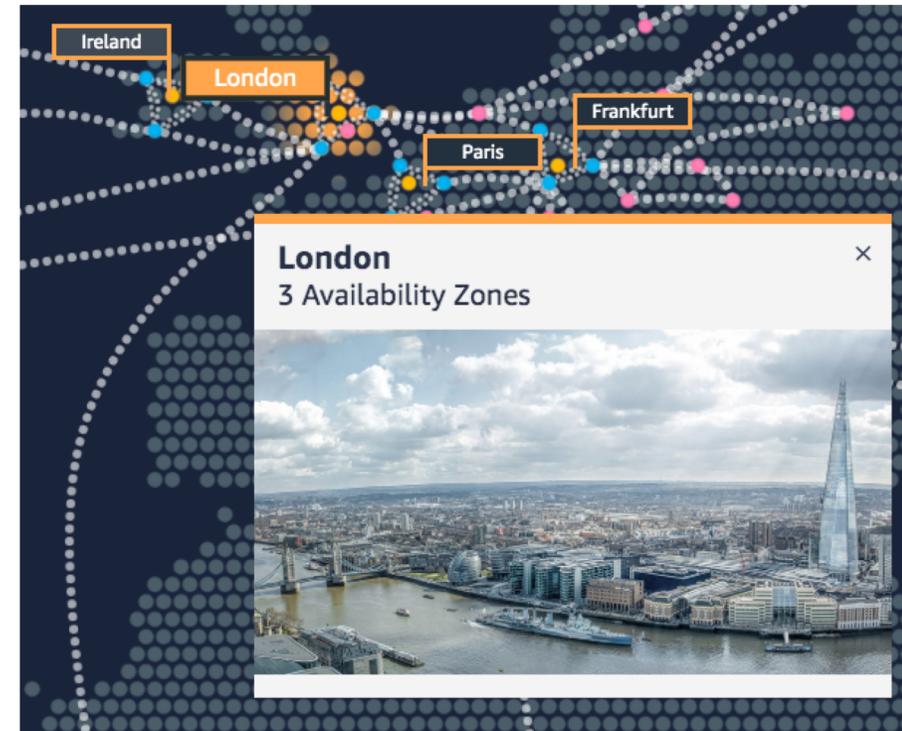
- The **AWS Global Infrastructure** is designed and built to deliver a **flexible**, **reliable**, **scalable**, and **secure** cloud computing environment with high-quality **global network performance**.
- This map from <https://infrastructure.aws> shows the current **AWS Regions** and more that are coming soon.



Educator-Led Demo: AWS Global Infrastructure Details



- 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

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



Data governance, legal requirements



Proximity to customers (latency)



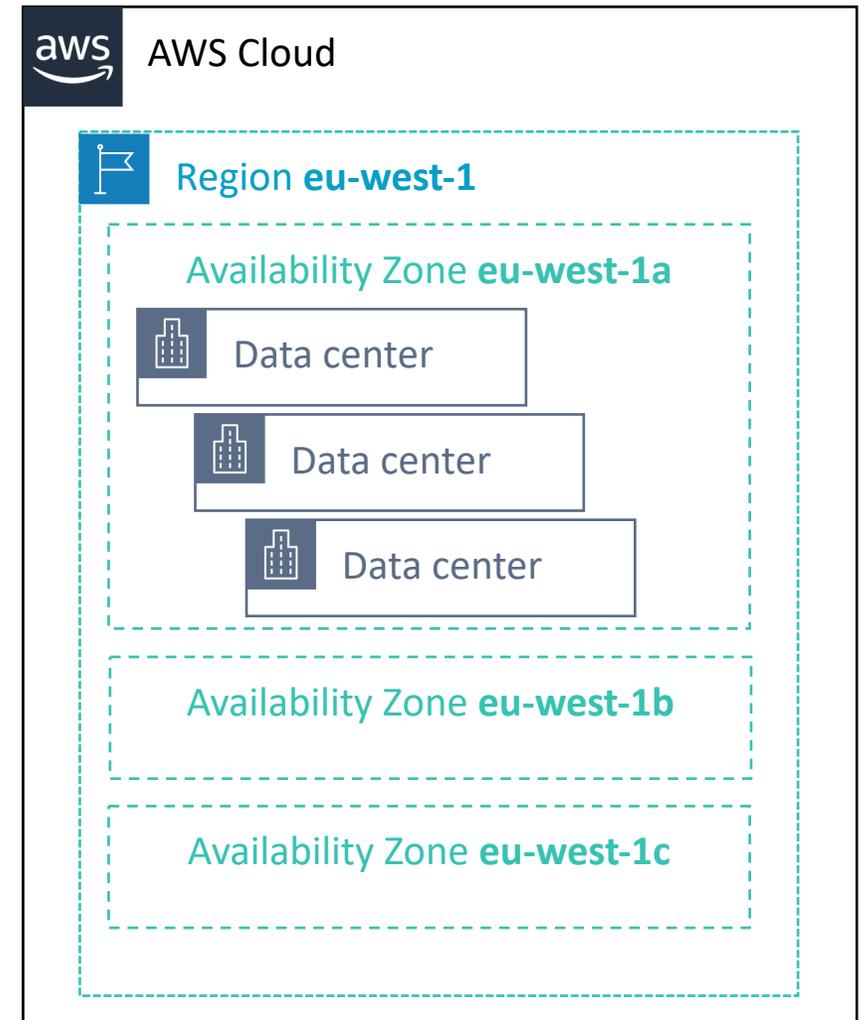
Services available within the Region



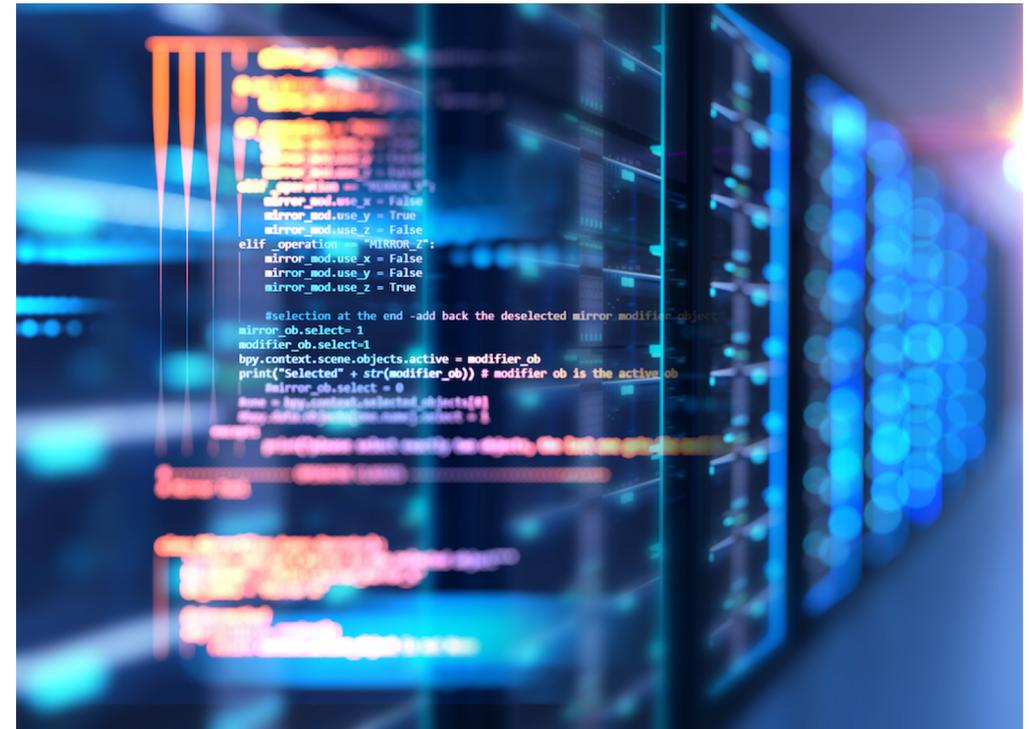
Costs (vary by Region)

Availability Zones

- Each **Region** has multiple Availability Zones.
- Each **Availability Zone** is a fully isolated partition of the AWS infrastructure.
 - There are currently 69 Availability Zones worldwide
 - 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.

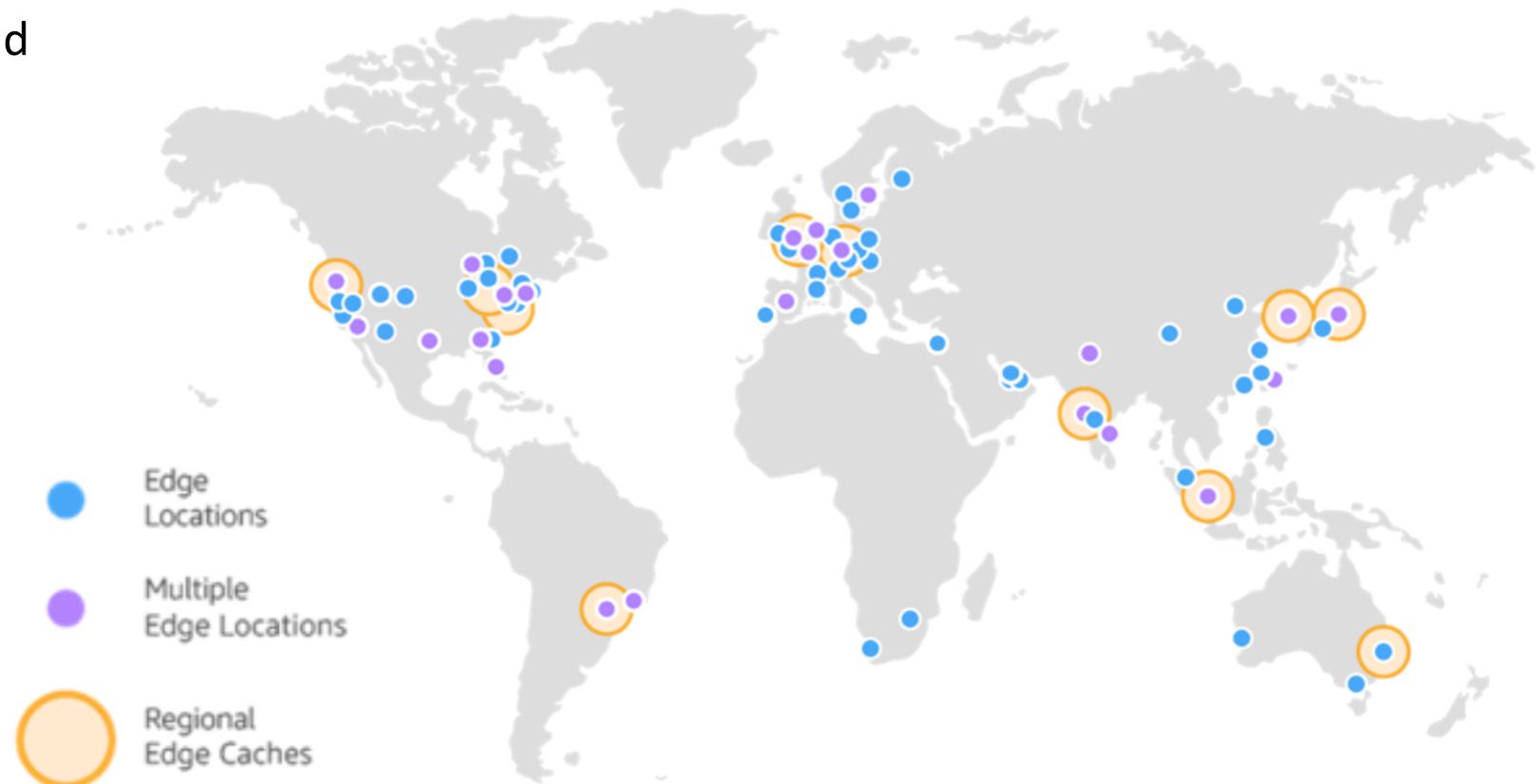


- AWS data centers are **designed for security**.
- Data centers are where the data resides and data processing occurs.
- Each data center has redundant power, networking, and connectivity, and is housed in a separate facility.
- A data center typically has 50,000 to 80,000 physical servers.



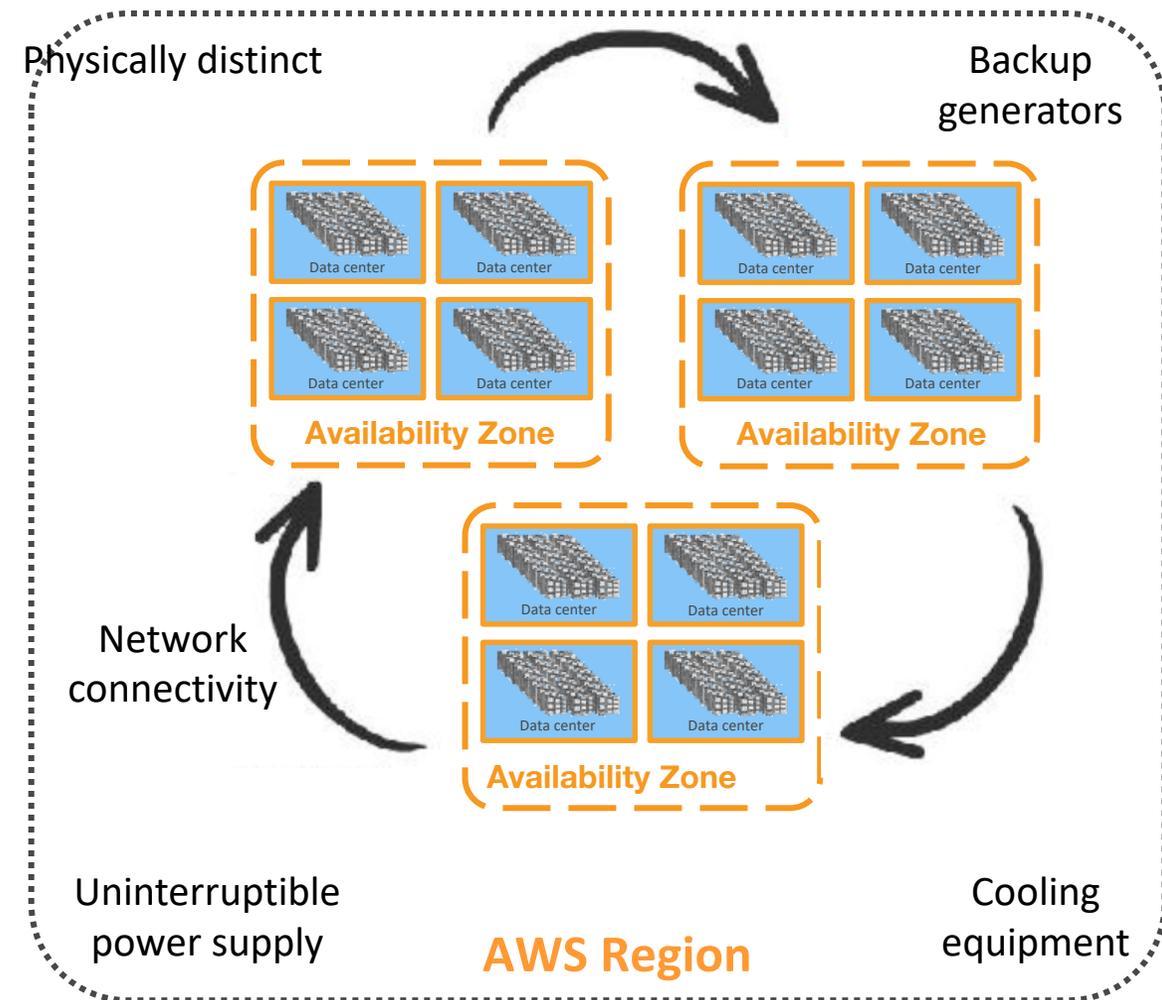
Points of Presence

- AWS provides a global network of 187 **Points of Presence** locations
- Consists of 176 **edge locations** and 11 **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.

Module 3: AWS Global Infrastructure Overview

Section 2: AWS services and service category overview

AWS foundational services

Applications



Virtual desktops



Collaboration and sharing

Platform Services

Databases

Relational

NoSQL

Caching

Analytics

Cluster 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

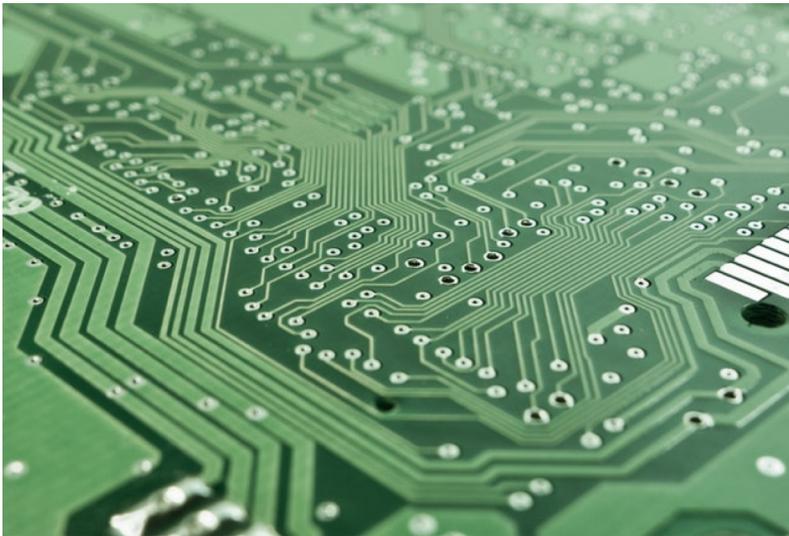
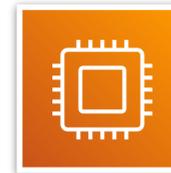


Photo from <https://www.pexels.com/photo/technology-computer-lines-board-50711/>



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

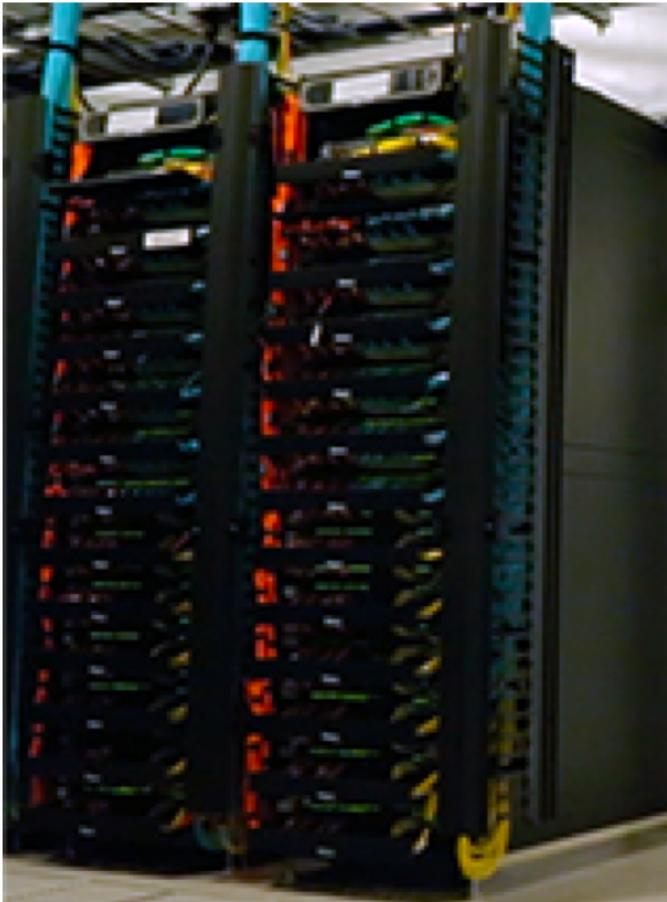
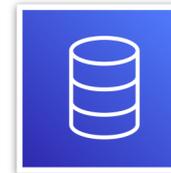


Photo from <https://aws.amazon.com/compliance/data-center/data-centers/>



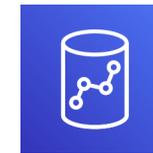
AWS Database services



Amazon Relational Database Service



Amazon Aurora



Amazon Redshift



Amazon DynamoDB

Networking and content delivery service category



Photo by Umberto on Unsplash



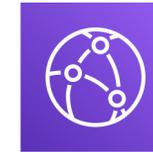
AWS networking and content delivery services



Amazon VPC



Elastic Load Balancing



Amazon CloudFront



AWS Transit Gateway



Amazon Route 53



AWS Direct Connect



AWS VPN

Security, identity, and compliance service category



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



Photo by Alexander Mills on Unsplash



AWS cost management services



AWS Cost and Usage Report



AWS Budgets



AWS Cost Explorer

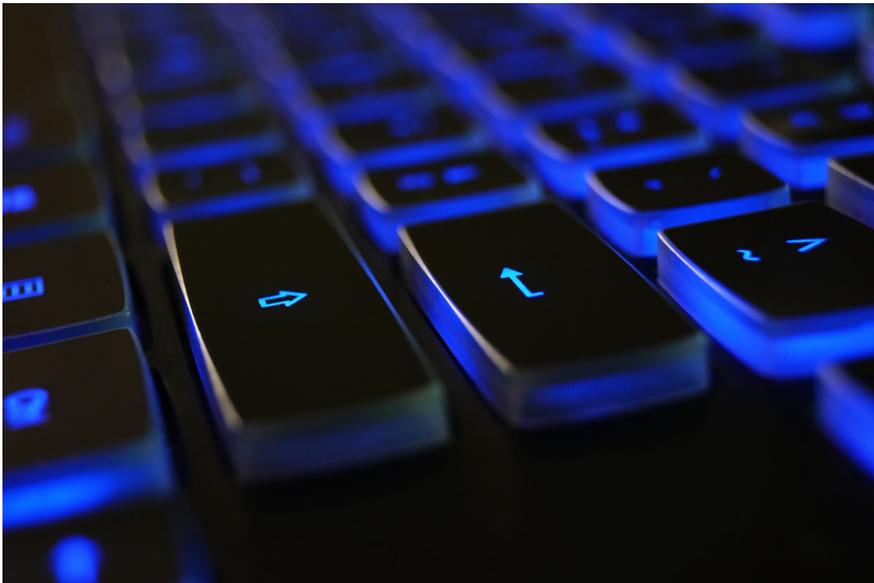


Photo by Marta Branco from Pexels



AWS management and governance services



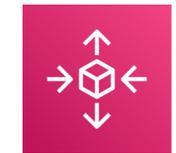
AWS Management Console



AWS Config



Amazon CloudWatch



AWS Auto Scaling



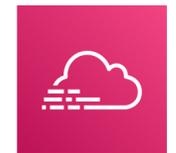
AWS Command Line Interface



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



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.

- **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 3: AWS Global Infrastructure Overview

Module wrap-up

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?

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

- [AWS Global Infrastructure](#)
- [AWS Global Infrastructure Region Table](#)
- [AWS Cloud Products](#)

Thank you

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