

**CS 4037**

**Introduction to Cloud**

**Computing**

**Lecture 23**

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# AWS Global Infrastructure

# Lecture's Agenda

- AWS Global Infrastructure
- Regions and Availability Zones
- Data Centers and Point of Presence
- Infrastructure Features

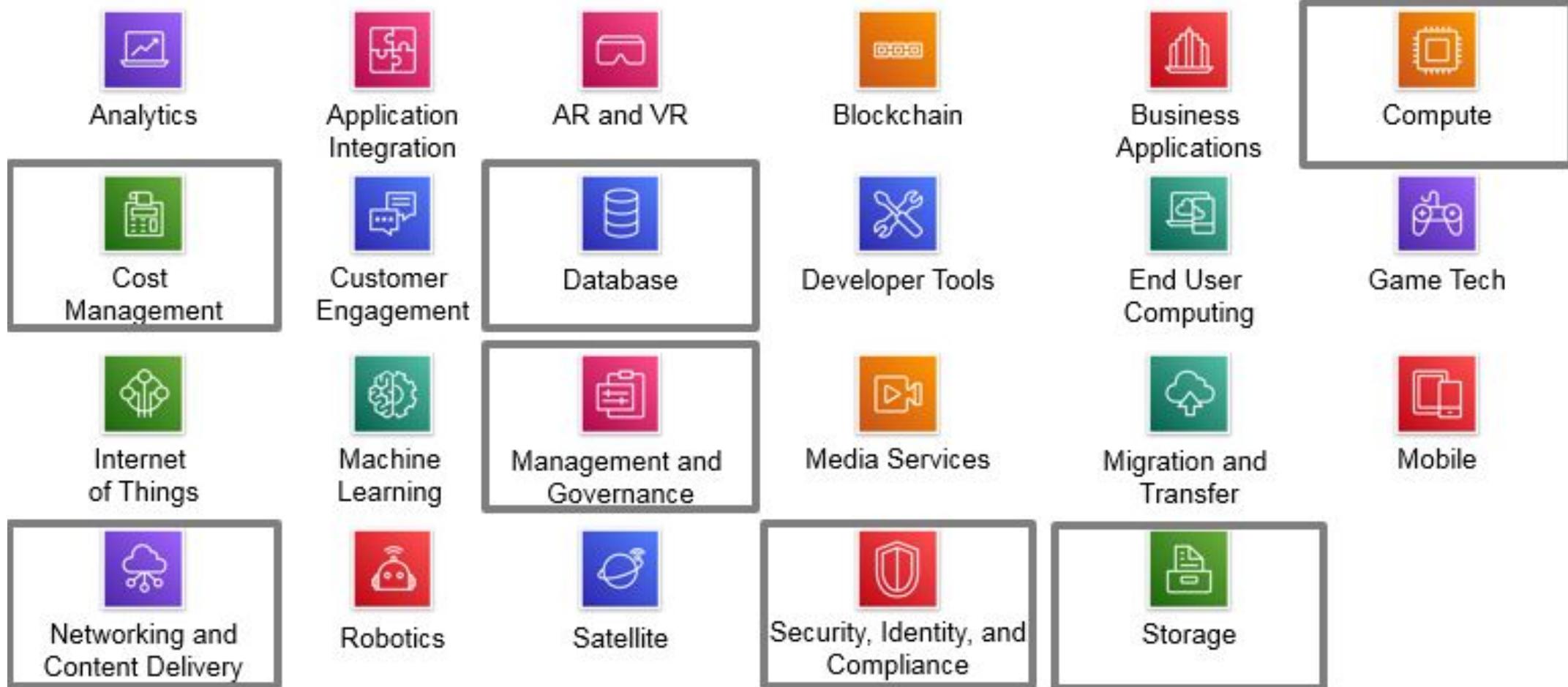


# AWS Global Infrastructure

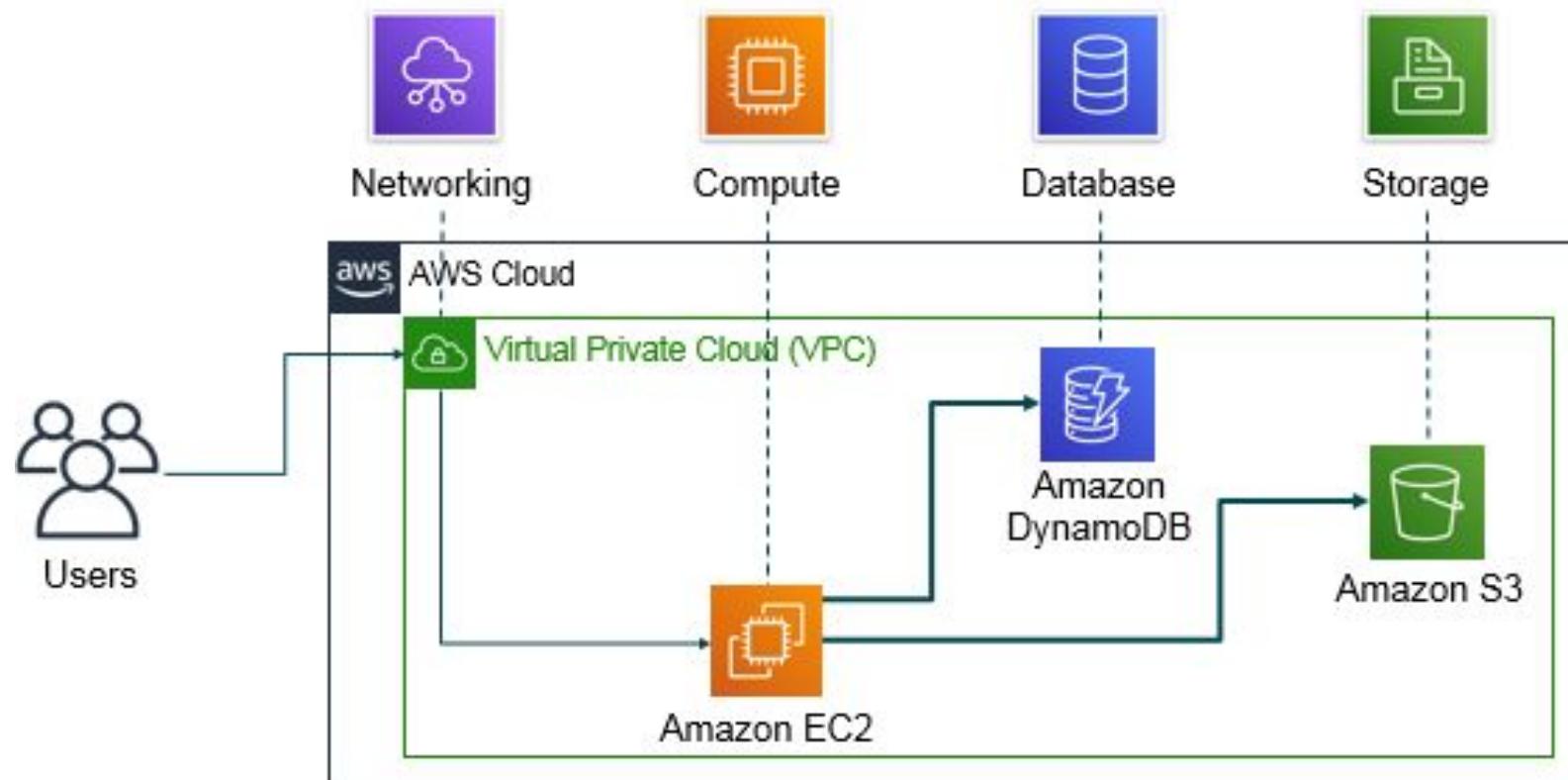
- Designed and built to deliver a flexible, reliable, scalable, and secure cloud computing environment with high-quality global network performance
- AWS continually updates its global infrastructure footprint



# Categories of AWS services



# Sample Solution Example



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# AWS Regions

- AWS Cloud infrastructure is built around Regions
  - AWS has **30+ Regions** worldwide
  - AWS China and AWS GovCloud (US) Regions
- “An **AWS Region** is a physical geographical location with one or more **Availability Zones**”
  - Availability Zones consist of one or more data centers



Example: London Region

# AWS Regions (Cont.)

- Data replication across regions is **controlled by customer**
- Communication between regions **uses AWS backbone network infrastructure**
- Each region **provides full redundancy to the network**



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)



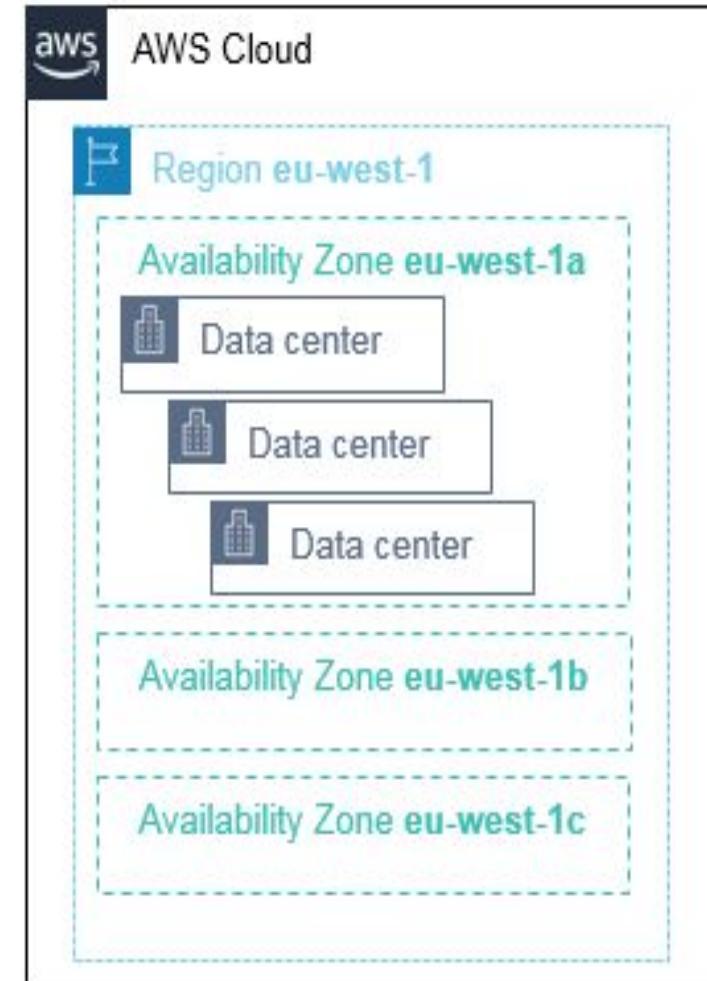
Services available  
within the Region



Costs (vary by Region)

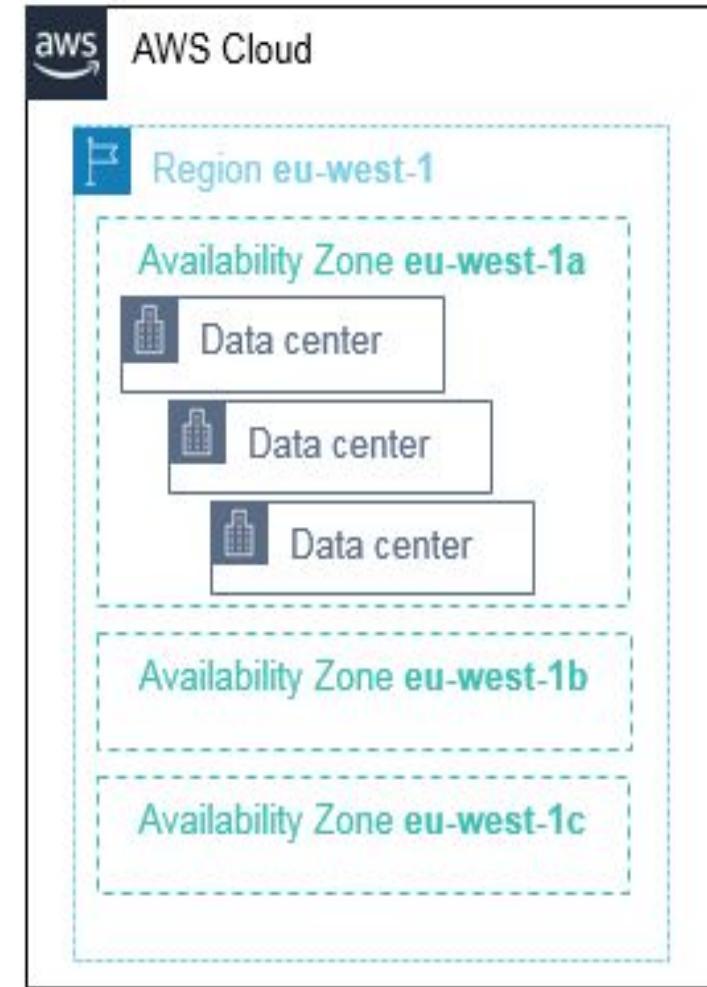
# Availability Zones

- “Availability Zone is a fully isolated partition of the AWS infrastructure”
  - Consists of discrete data centers
  - Designed for fault isolation
  - Customer chooses Availability Zones
- Availability Zones are 100 km away from each other



# Availability Zones (Cont.)

- AWS recommends replicating data and resources across availability zones for resiliency
- Customers cannot specify a specific data center in AWS
  - Customer view is limited to availability zones only
- Many cloud providers give option to customers to choose a specific data center where their data should reside and/or replicate



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# Data Centers

- Data centers are where the **data resides** and data processing occurs
- Each data center has redundant power, hardware, and connectivity, and is **housed in a separate facility**
  - A data center typically has 50,000 to 80,000 physical servers.
  - Availability Zone: NUCES LHR
  - Data Centers: Blocks A, B, C, D, E & F.



# Point 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 by Amazon CloudFront and Amazon Route 53 services
  - CloudFront: A global CDN that delivers content to end users with reduced latency
  - Amazon Route 53 is a Domain Name System (DNS) service



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- **Infrastructure Features**



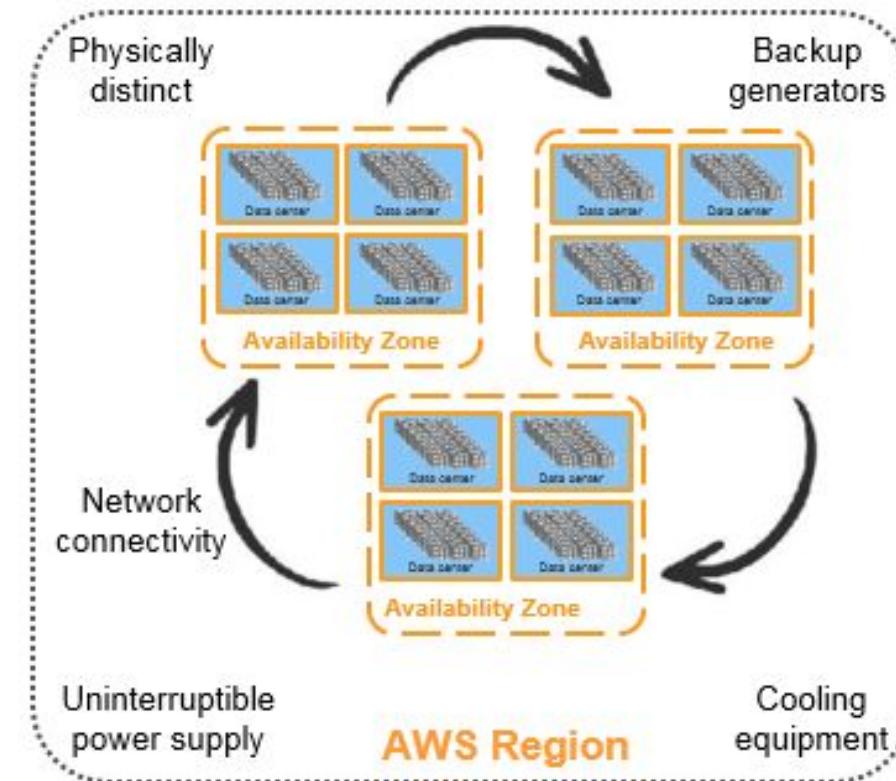
# Infrastructure Features

## Elasticity:

- Elastic infrastructure
- Dynamic adaption of capacity

## Scalability:

- Scalable infrastructure
- Adapts to accommodate growth



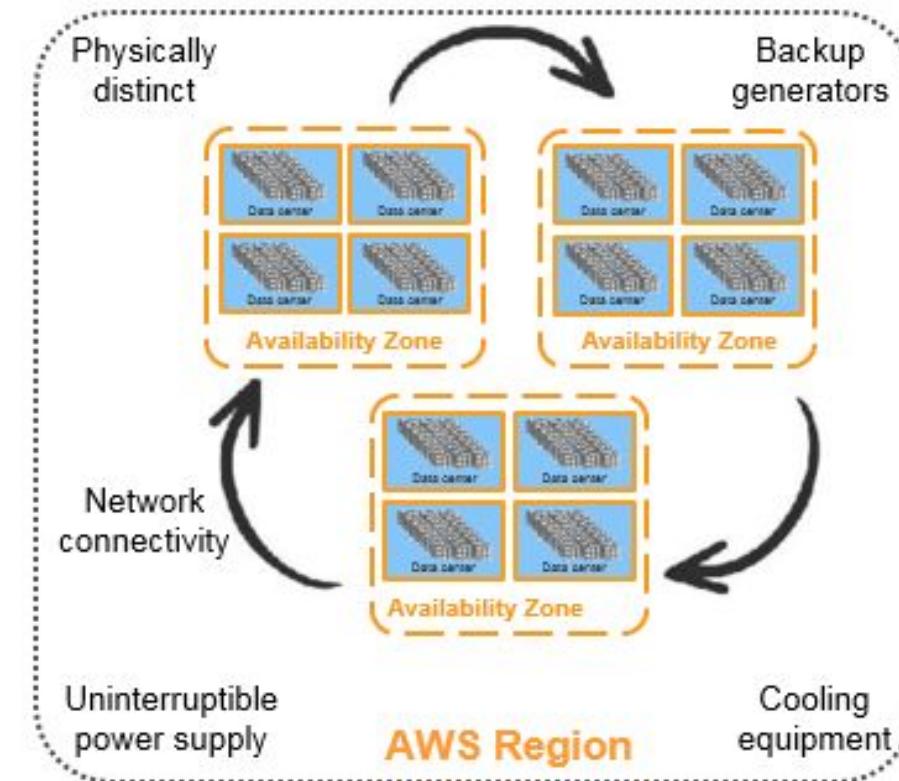
# Infrastructure Features (Cont.)

## 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



# **Additional Resources (Cont.)**

- 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/>**

# Questions?