Week3: Introduction to Cloud Computing

Jenna Kim

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Outline

- Introduction to cloud computing
- Advantages of cloud computing
- Introduction to Amazon Web Services (AWS)
- In-class activity: AWS Academy Learner Lab Demo

Part 1: Introduction to Cloud Computing

What is cloud computing?

Cloud computing defined

Cloud computing is the **on-demand** delivery of computer system resources, especially data storage and computing power, without active management by users.

What cloud computing tries to solve

- Before the cloud, deploying web services was a very expensive process
- A web application deployment:
  - Purchase servers
  - Correct amount of storage and memory
  - Setup process
  - Additional costs: electricity, security concerns
  - Lack of expert in server management

Cloud service providers

- **Amazon AWS (Amazon Web Services)**
- **Google (Google Cloud Platform)**
- **Microsoft (Azure)**

Different cloud services

IaaS
(infrastructure as a service)

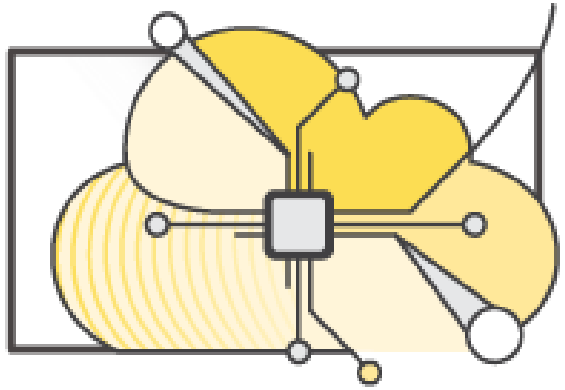
PaaS
(platform as a service)

SaaS
(software as a service)

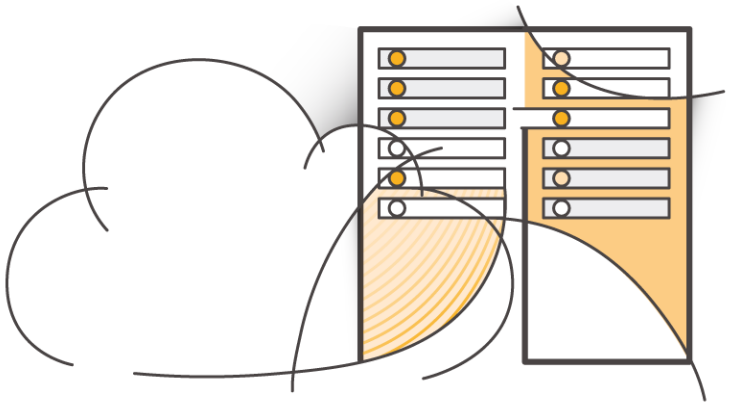
More control
over IT resources

Less control
over IT resources

Cloud computing deployment models



Cloud



Hybrid

On-premises
(private cloud)

Key takeaways

- Cloud computing is the on-demand delivery of computer system resources.
- 3 cloud service models:
  - IaaS
  - PaaS
  - SaaS
- 3 cloud deployment models:
  - cloud
  - hybrid
  - on-premises or private cloud
- Almost anything you can implement with traditional IT can also be implemented with cloud computing service.

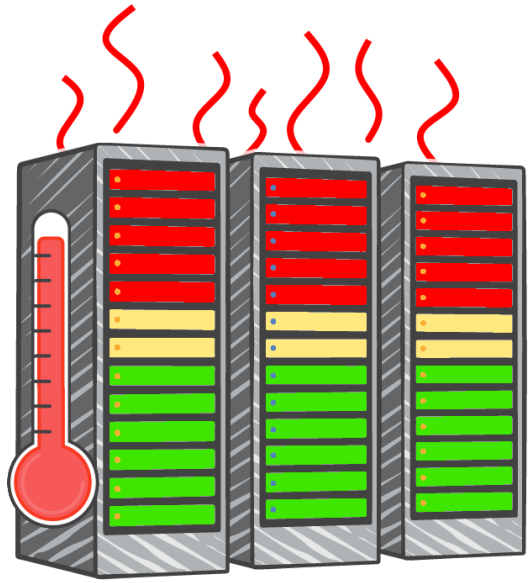
Part 2: Advantages of cloud computing

Massive economies of scale

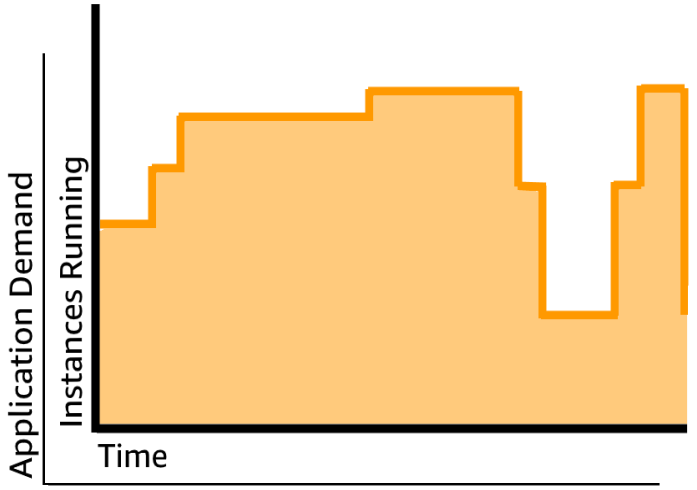
Because of aggregate usage from all customers, AWS can achieve higher economies of scale and pass savings on to customers.

Stop guessing capacity

Overestimated server capacity



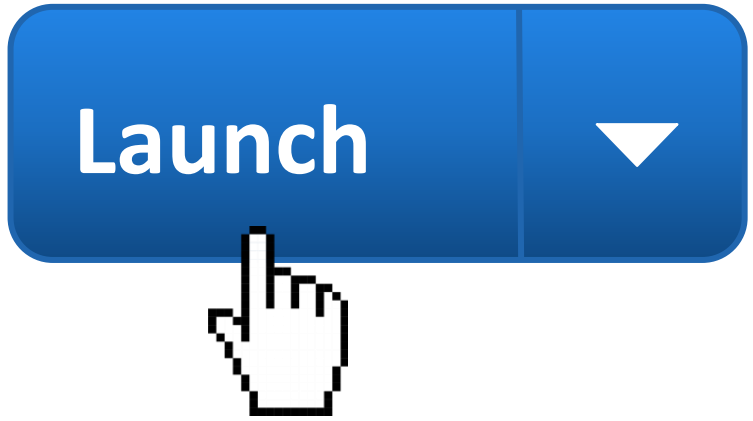
Underestimated server capacity



Scaling on demand

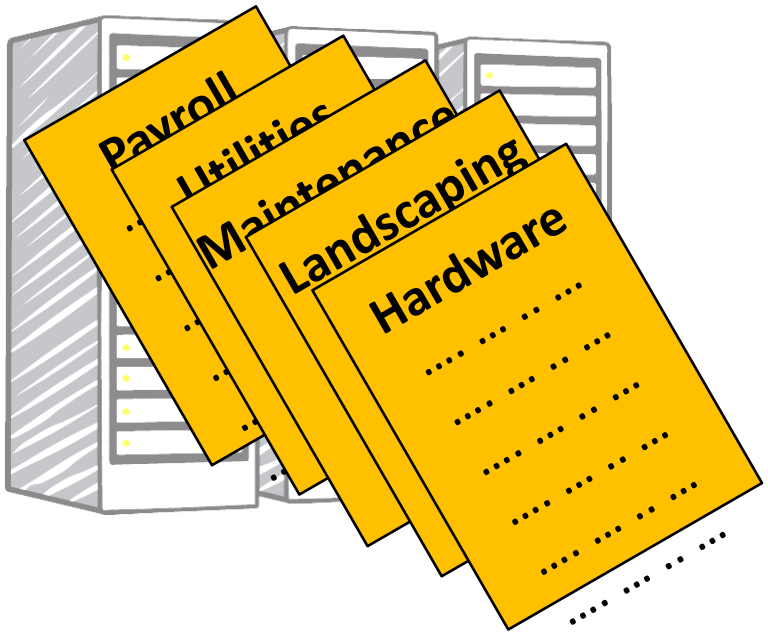
Increase speed and agility

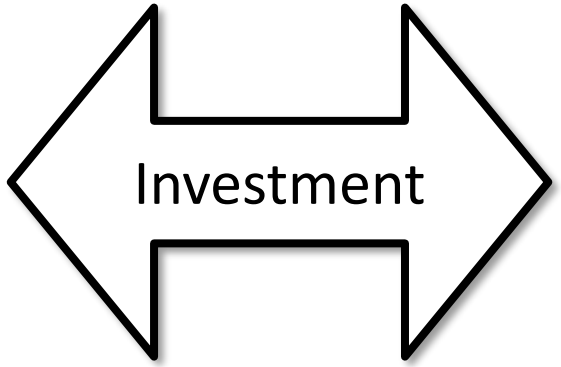
Weeks between wanting resources and having resources

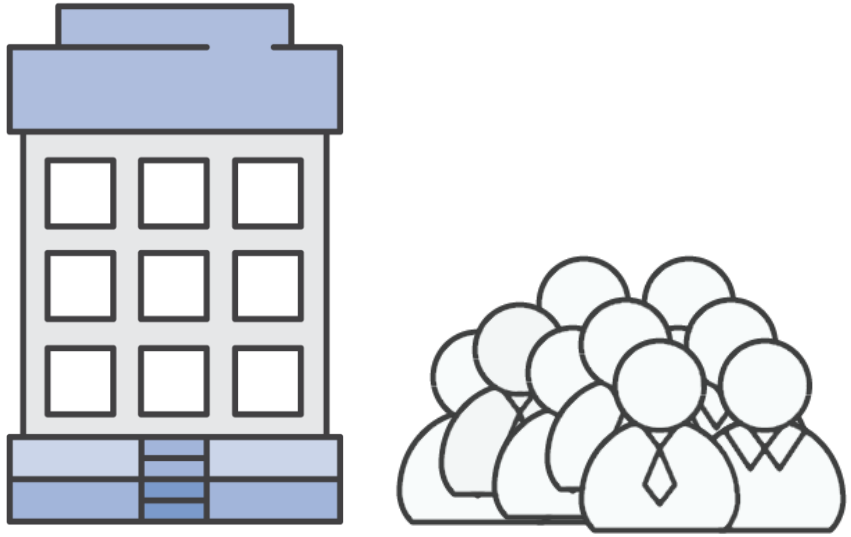


Minutes between wanting resources and having resources

Stop spending money on running and maintaining data centers



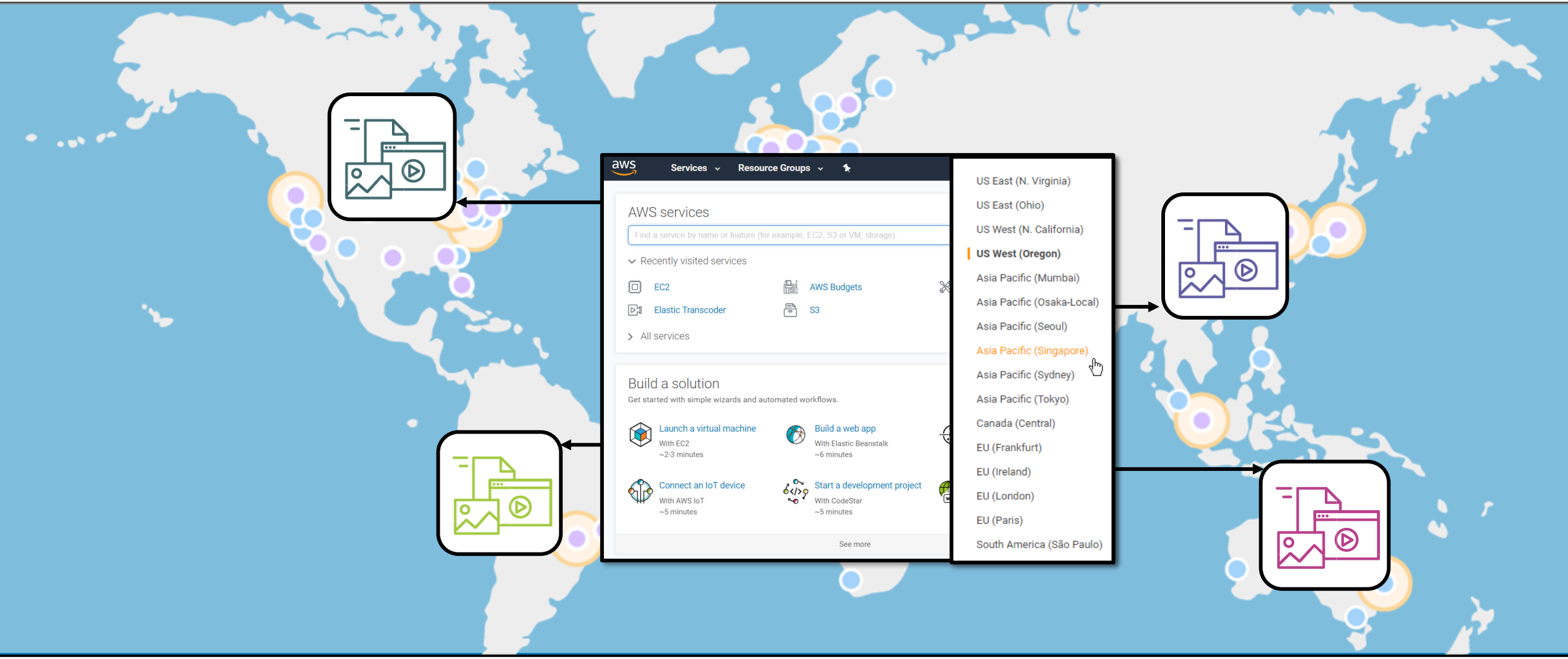




Running data centers

Business and customers

Go global in minutes



Key takeaways

- Benefit from massive economies of scale
- Stop guessing capacity
- Increase speed and agility
- Stop spending money on running and maintaining data centers
- Go global in minutes

Part 3: Introduction to Amazon Web Services (AWS)

What is AWS?

- AWS is a **secure cloud platform**
- Offers a **broad set of global cloud-based products**.
- AWS provides you with **on-demand access** to compute, storage, network, database, and other IT resources.
- **Pay only for the services you need**, for as long as you use them.
- AWS services **work together** like building blocks.

Categories of AWS 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

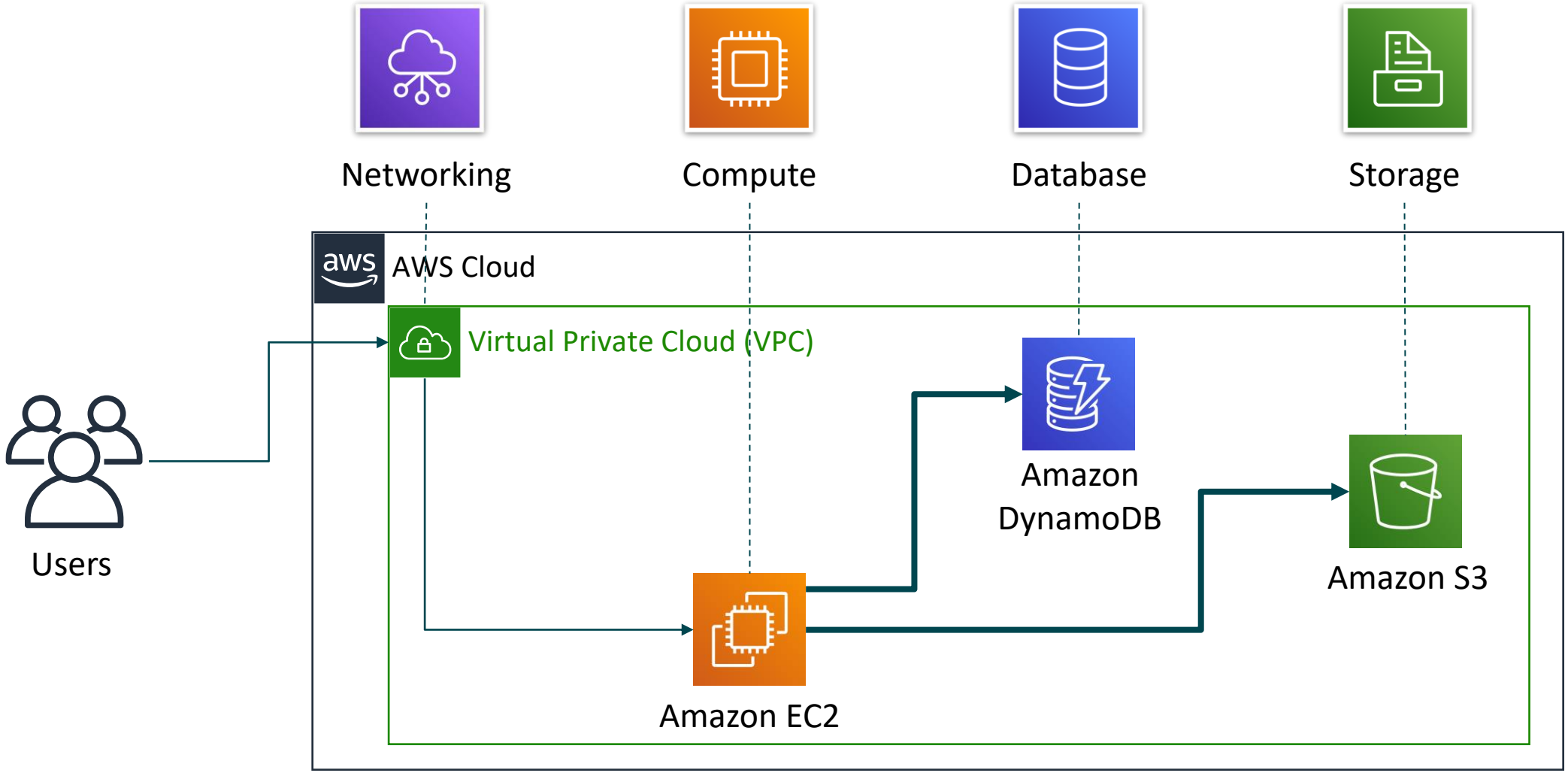

Robotics


Satellite


Security, Identity, and Compliance


Storage

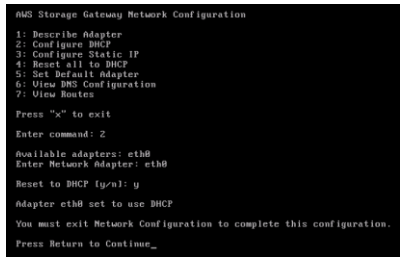
Simple solution example



Three ways to interact with AWS

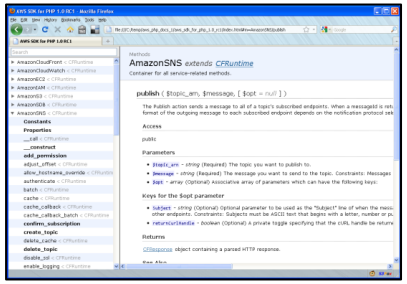
AWS Management Console

Easy-to-use graphical interface



Command Line Interface (AWS CLI)

Access to services by discrete commands or scripts



Software Development Kits (SDKs)

Access services directly from your code (such as Java, Python, and others)

Key takeaways

- AWS is a secure cloud platform
- Offers a broad set of global cloud-based products called services.
- Many categories of AWS services
- Choose a service based on your research goals and technology requirements
- 3 ways to interact with AWS services
  - AWS Management Console
  - AWS Command Line Interface (CLI)
  - Software Development Kits (SDKs)

Summary

In this class, you learned how to:

- Define different types of cloud computing models
- Describe six advantages of cloud computing
- Recognize the main AWS service categories and core services

In-Class Activity:
AWS Academy Learner Lab Demo

Let’s Take a 10-min Break!

In-Class Activity:
AWS Academy Learner Lab Demo

Resources

In UIUC Canvas page, go to “In-Class Activity” module:

- Week3: AWS Academy Learner Lab Demo
- Log in with your account and password
- Let’s walk through all the steps together!