



# Introduction to Cloud Computing

# Outline

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- Introduction to cloud computing
- Advantages of cloud computing
- Introduction to Amazon Web Services (AWS)

# Part 1: Introduction to Cloud Computing

# What is cloud computing?

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# Cloud computing defined

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**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

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- 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

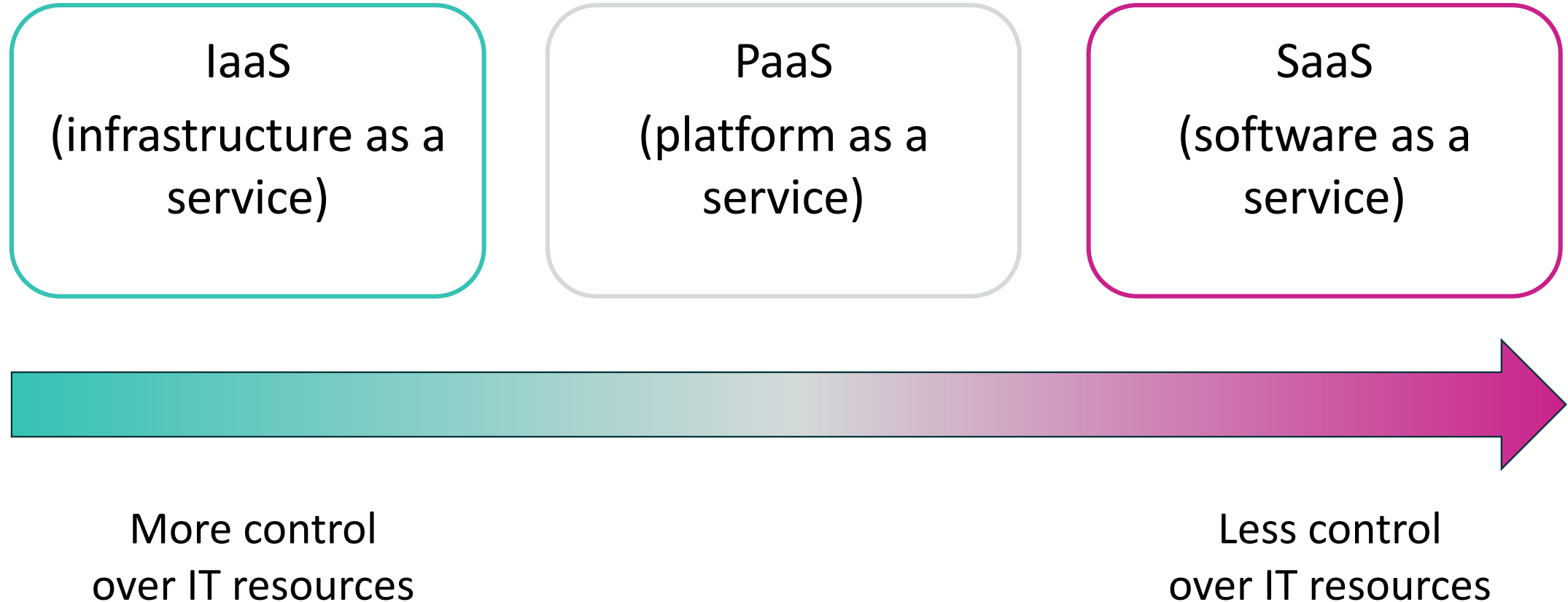
# Cloud service providers

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

# Different cloud services

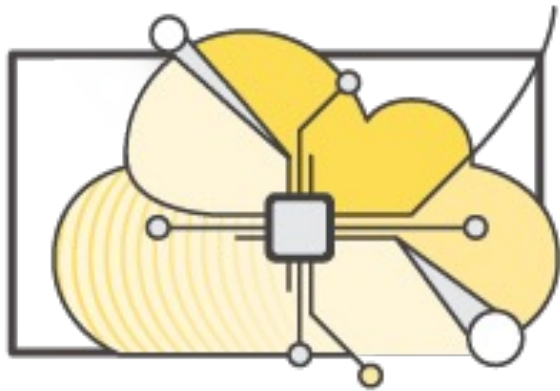
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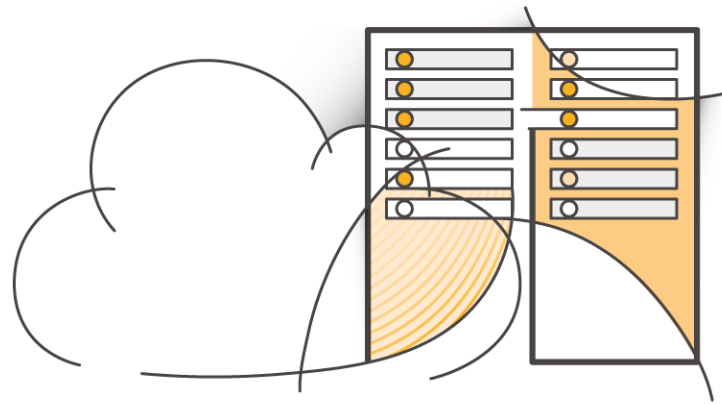


# Cloud computing deployment models

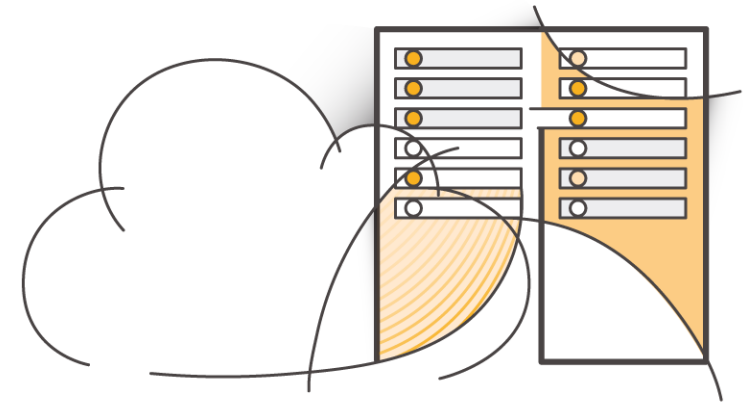
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Cloud



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

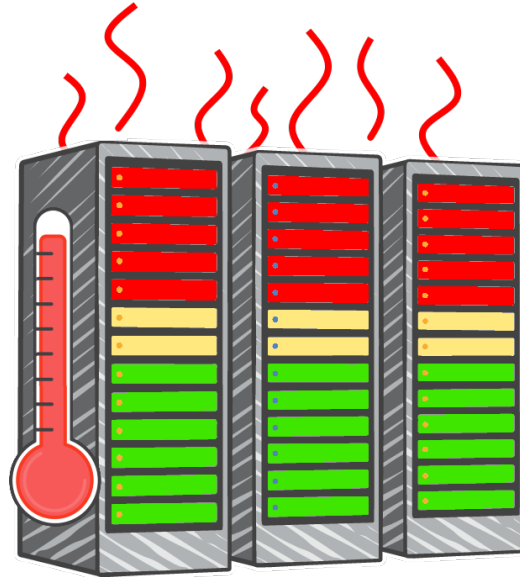
Because of aggregate usage from all customers, AWS can achieve higher economies of scale and pass savings on to customers.



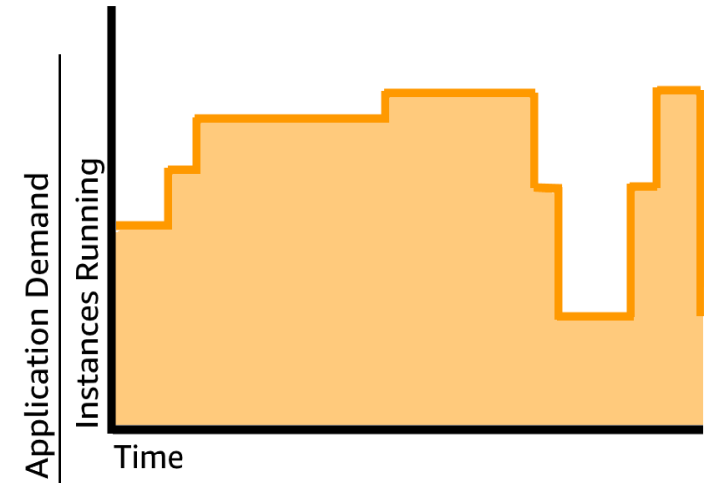
# Stop guessing capacity



Overestimated server capacity



Underestimated server capacity



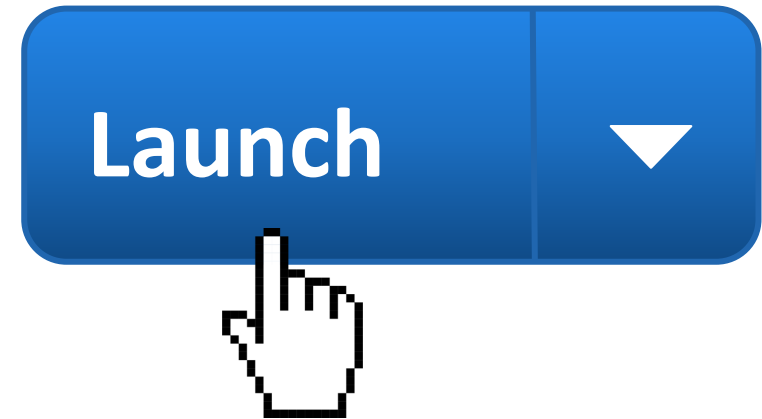
Scaling on demand

# Increase speed and agility

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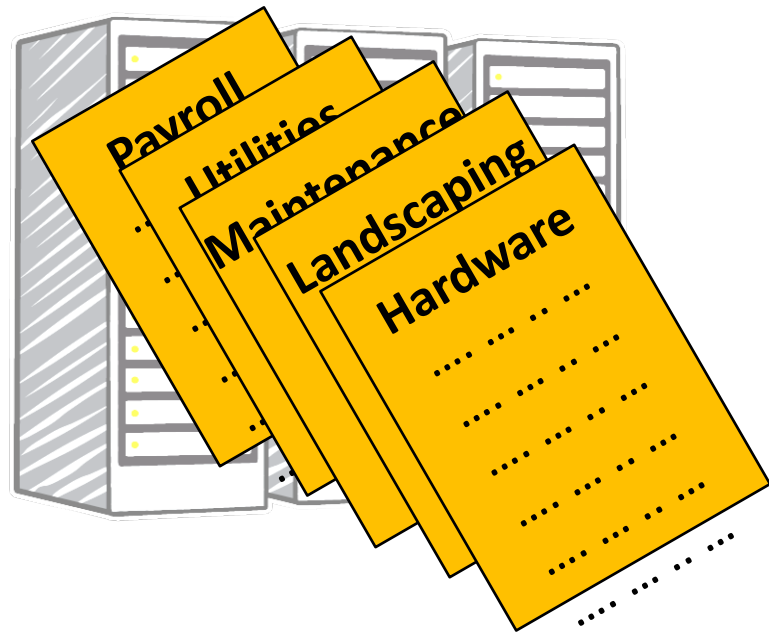
*Weeks* between wanting resources and having resources



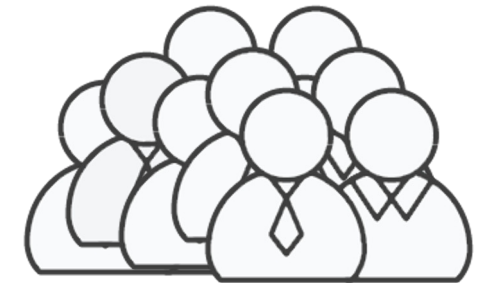
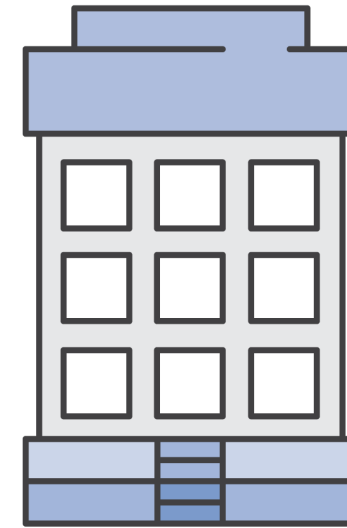
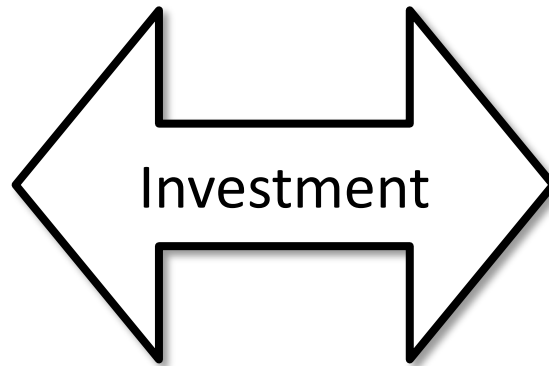
*Minutes* between wanting resources and having resources

# Stop spending money on running and maintaining data centers

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Running data centers



Business and customers

# Go global in minutes

The image shows a screenshot of the AWS console interface overlaid on a world map. The console displays the 'AWS services' section with a search bar and a list of 'Recently visited services' including EC2, Elastic Transcoder, AWS Budgets, and S3. Below this, the 'Build a solution' section offers quick-start options: 'Launch a virtual machine' (With EC2, ~2-3 minutes), 'Build a web app' (With Elastic Beanstalk, ~6 minutes), 'Connect an IoT device' (With AWS IoT, ~5 minutes), and 'Start a development project' (With CodeStar, ~5 minutes). A dropdown menu on the right lists various AWS regions, with 'US West (Oregon)' highlighted in orange. A hand cursor is positioned over 'Asia Pacific (Sydney)'. Three callout boxes with icons (blue, green, and purple) are connected to the map by arrows, indicating deployment locations in North America, South America, and Asia.



# 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?

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- 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



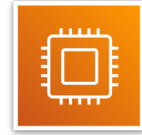
AR and VR



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



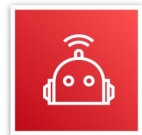
Migration and Transfer



Mobile



Networking and Content Delivery



Robotics



Satellite

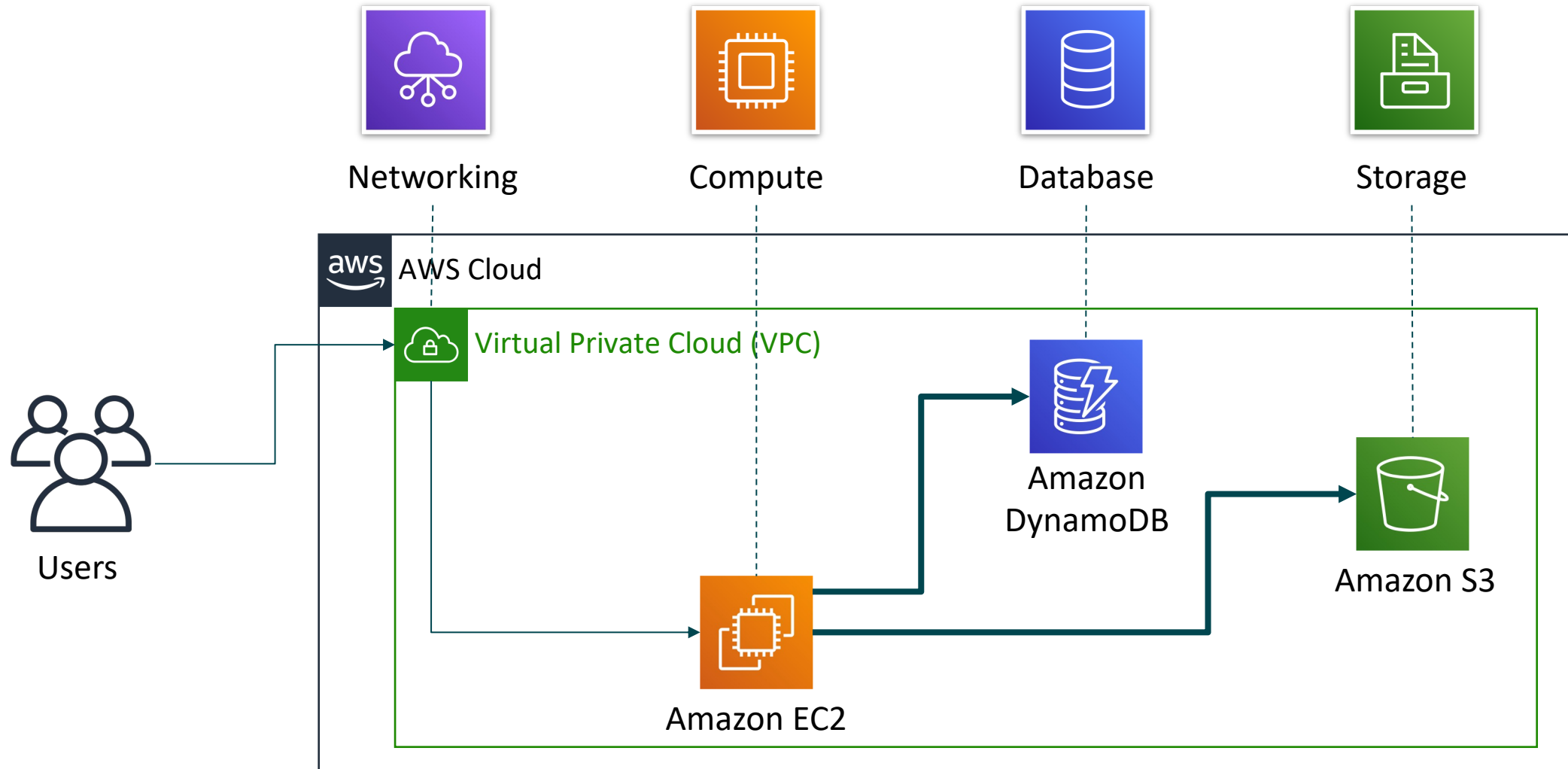


Security, Identity, and Compliance

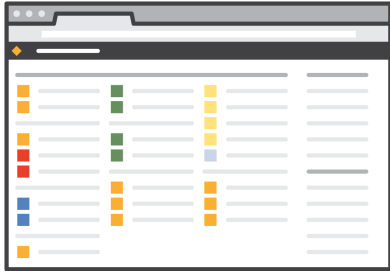


Storage

# Simple solution example



# Three ways to interact with AWS



## AWS Management Console

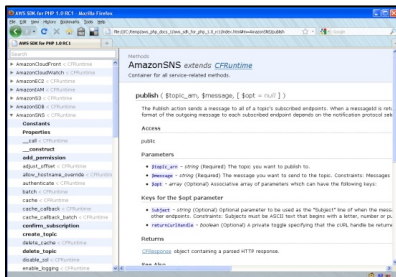
Easy-to-use graphical interface

```
AWS Storage Gateway Network Configuration
1: Describe Adapter
2: Configure DHCP
3: Configure Static IP
4: Reset all to DHCP
5: Set Default Adapter
6: View DNS Configuration
7: View Routes

Press "x" to exit
Enter command: 2
Available adapters: eth8
Enter Network Adapter: eth8
Reset to DHCP (y/n): y
Adapter eth8 set to use DHCP
You must exit Network Configuration to complete this configuration.
Press Return to Continue_
```

## 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

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In this class, you learned how to:

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