AWS Academy Introduction to Cloud - 1

Unit 1: Cloud Structure and Features

Unit overview

Modules

- Global Infrastructure
- Structures of the Cloud

Knowledge check

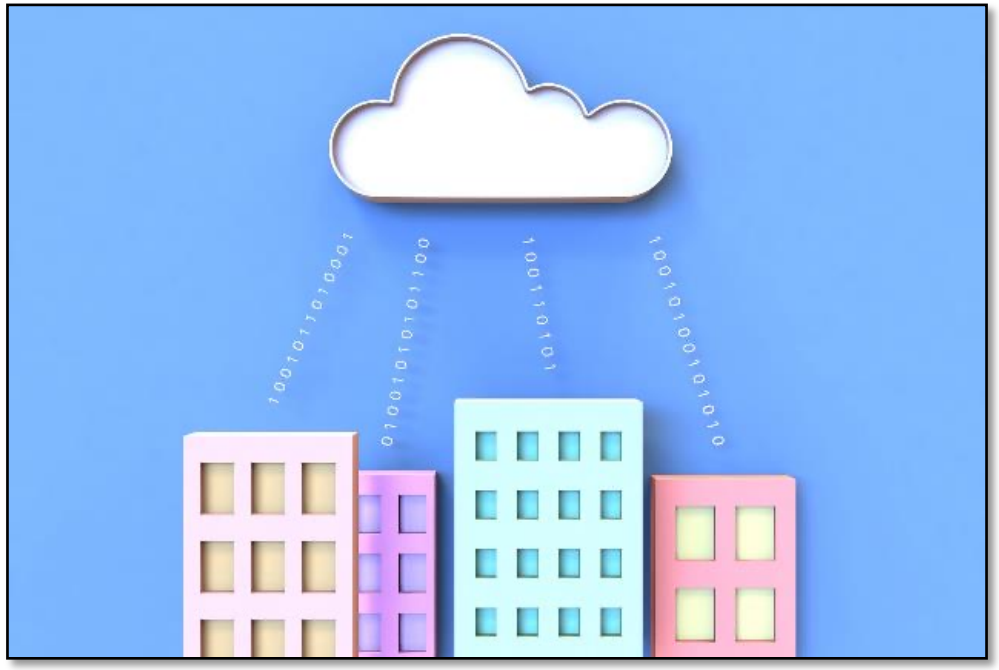
Unit 1: Cloud Structure and features

Section 1: Global Infrastructure

aws academy

What is cloud computing?

Any time you are working or storing information online (for example, sending an email or watching a streaming video)—as opposed to on your local computer or on a server on your local network—you are using cloud computing.



Why do businesses use cloud computing?

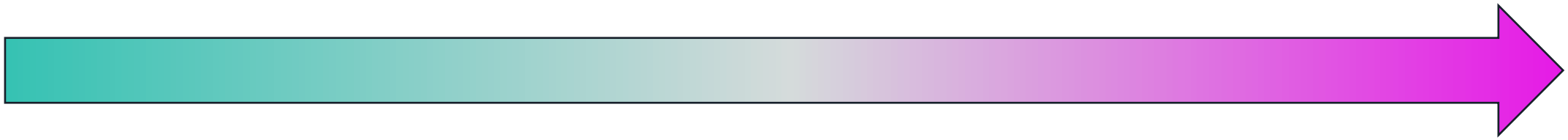
- Trade capital expense for variable expense
- Benefit from massive economies of scale
- Stop guessing capacity
- Increase speed and agility
- Stop spending money running and maintaining data centers
- Go global in minutes

Cloud service models

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 service models

Type of Cloud Service	What It Does	Examples
Infrastructure as a service (IaaS)	Compute power, networking, and storage provided over the internet	Amazon Elastic Compute Cloud (Amazon EC2), Rackspace, Google Compute Engine
Platform as a service (PaaS)	Tools provided over the internet for making programs and applications	AWS Elastic Beanstalk, Microsoft Azure, Google App Engine
Software as a service (SaaS)	Applications and programs that are accessed and provided over the internet	Dropbox, Slack, Spotify, YouTube, Microsoft Office 365, Gmail

History of AWS

- Origins began in 2002 when Amazon started the Amazon.com web service.
- In 2003, Amazon realized that its infrastructure services could give them an advantage over the competition.
- In 2004, Amazon publicly announced that it was working on a cloud service.
- In 2006, Amazon launched AWS with just a few of the services that are still around today.
- By 2009, AWS added more services.
- AWS has developed partnerships with several large companies. AWS has been growing and adding new services and tools ever since.

Questions time

Question 1

- **Imagine if one of your social media accounts was hacked and all your data was made public or held for ransom. How would this make you feel? Do you think the trade-off is worth the risk to have all the cloud services at your fingertips?**

10 minutes

Question 1

- **Imagine if one of your social media accounts was hacked and all your data was made public or held for ransom. How would this make you feel? Do you think the trade-off is worth the risk to have all the cloud services at your fingertips?**

Discussion

Question 2

- **What kind of information do you have stored online? What are the risks of that information being compromised or shared without your consent? What kinds of laws or regulations do you think are necessary to keep your information safe?**

10 minutes

Question 2

- **What kind of information do you have stored online? What are the risks of that information being compromised or shared without your consent? What kinds of laws or regulations do you think are necessary to keep your information safe?**

Discussion

Question 3

- **What are some ways that the internet has made your life easier? What are some ways that the internet has made your life more difficult? What is one thing you wish you could do online, but the technology doesn't exist yet?**

10 minutes

Question 3

- **What are some ways that the internet has made your life easier? What are some ways that the internet has made your life more difficult? What is one thing you wish you could do online, but the technology doesn't exist yet?**

Discussion

Activity 1

- Define cloud computing and its impacts.
- Identify the benefits of cloud computing.

30 minutes

Activity 1 – Keyword definitions

- ***Cloud computing:*** *The on-demand delivery of compute power, databases, storage, applications, and other IT resources using the internet with pay-as-you-go pricing.*
- ***AWS:*** *A platform that provides a wide range of cloud computing services.*
- ***Cloud storage:*** *Saving data using a CSP instead of a physical machine.*
- ***Server:*** *A computer designed to process requests and deliver data to another computer over the internet or a local network. In the cloud, a server is hosted by an outside provider, which is accessed over the internet.*

Activity 1 – Benefits of cloud computing

- *Less upfront costs; pay more as business grows*
- *Costs spread out over many people, making the service cheaper for everyone*
- *Power and storage that always scale to fit the amount you are using so you only pay for exactly what you need and use*
- *Increased speed and agility*
- *Permits businesses to focus on their business instead of maintaining servers*
- *Easier to release information or advertising anywhere in the world*

Activity 2 – AWS Services

AWS Service	What It Is	What It Is Used For
Amazon EC2	*A web service that provides secure, resizable compute capacity in the cloud. Think of it as renting a computer in the cloud.*	*Provides computing resources for hosting websites, running applications, streaming content, and any number of other computational projects.*
Amazon RDS	*Relational database service*	*Lets developers create and manage relational databases in the cloud. Think of a relational database as a set of data with one-to-one relationships. For example, a database of transactions in a store would match every customer account number with their customer ID. Amazon RDS lets developers track large amounts of this data, organize it, and search it easily.*

Activity 2 – AWS Services

AWS Service	What It Is	What It Is Used For
CloudFront	*CDN*	*Used to deliver videos, data, applications, and any other digital information quickly and with low latency all over the globe.*
Amazon S3	*Storage for the internet. Think of it as a hard drive in the cloud that gets bigger or smaller depending on what you need. Data is stored in buckets (folders).*	*Used to store any amount of data online to make sure that it is safe, secure, and easy to access from anywhere.*

Activity 2

- Compare the major services offered by cloud computing providers.

30 minutes

Activity 2 – AnyCompany Lighting

- AnyCompany Lighting is a business that is trying to bring machine learning to lighting in homes, offices, and all other types of buildings. The lights use artificial intelligence to learn about human behavior patterns and turn on and off when necessary to save energy. Which cloud provider can help them bring their product to market?

Activity 2 – Example Stock Corp.

- Example Stock Corp. is a large stock-trading firm that stores a lot of their data on their own private servers for security reasons. They have a lot of clients and work with a lot of money, so security and reliability are hugely important. They want to expand their computing to the cloud for more flexibility and agility. Which cloud provider would be their best option?

Activity 3

- **Real-world business connections**
- https://aws.amazon.com/solutions/case-studies/

15 minutes

Unit 1: Cloud Structure and Features

Section 2: Structures of the Cloud

aws academy

AWS Global Cloud Infrastructure

- The AWS Global Cloud Infrastructure is the most secure, extensive, and reliable cloud platform, offering over 200 fully featured services from data centers globally.
- That infrastructure is made up of many different components including Regions, Availability Zones, and edge locations.

Technology terminology

- **Availability Zone:** One or more data centers that house many servers. Each Region has multiple, isolated locations known as Availability Zones. Each Availability Zone is isolated, but the Availability Zones in a Region are connected through low-latency links. An Availability Zone is represented by a region code followed by a letter identifier, for example, us-east-1a.
- **Edge location:** A site where data can be stored for lower latency. Often, edge locations will be close to high-population areas that will generate high traffic volumes.
- **Region:** An area where data is stored. Data storage in a Region closest to you is one of the reasons it can be accessed at lightning speed.

Technology terminology

- **Infrastructure as a service (IaaS):** A model in which virtual machines and servers are used for customers to host a wide range of applications and IT services are provided.
- **Platform as a service (PaaS):** A model that provides a virtual platform for customers to create custom software.
- **Software as a service (SaaS):** A model that provides applications using the internet that are managed by a third party.
- **Latency:** The delay before a transfer of data begins after the data has been requested.

Type of Cloud Services - IaaS

- These services contain the basic building blocks of the cloud. They provide access to computers—physical and virtual—and to network features and storage space. Think of IaaS like renting a kitchen. You can use all the different appliances (mixers, blenders, sinks), and you can rent a kitchen with better appliances if you need them.

- Examples: Amazon Elastic Compute Cloud (Amazon EC2), Rackspace, Google Compute Engine

Type of Cloud Services - PaaS

- These services contain the basic building blocks of the cloud. They provide access to computers—physical and virtual—and to network features and storage space. Think of IaaS like renting a kitchen. You can use all the different appliances (mixers, blenders, sinks), and you can rent a kitchen with better appliances if you need them.

- Examples: Amazon Elastic Compute Cloud (Amazon EC2), Rackspace, Google Compute Engine

Type of Cloud Services - SaaS

- These services are the actual apps and software provided over the internet. You are not responsible for managing or installing the software; you just access and use it. Think of SaaS as eating at an all-you-can-eat buffet. You have access to whatever food is being served. You don’t control what is made or how, but you can use as much as you want.

- Examples: Dropbox, Slack, Spotify, YouTube, Microsoft Office 365, Gmail

Questions time

Question 1

- **How does your computer get information from the internet? When you open a website, where does the website come from? Who provides the data?**

10 minutes

Question 1

- **How does your computer get information from the internet? When you open a website, where does the website come from? Who provides the data?**

Discussion

Question 2

- **What is a program or an app that you use that runs entirely in the cloud, meaning you don’t have to store anything on your computer or device? What do you use the program to do? How do you think the program is provided to you at little or no cost?**

10 minutes

Question 2

- **What is a program or an app that you use that runs entirely in the cloud, meaning you don’t have to store anything on your computer or device? What do you use the program to do? How do you think the program is provided to you at little or no cost?**

Discussion

Question 3

- **More and more programs and apps are being moved from being stored locally on individual computers to being in the cloud. For example, many people now use internet-based word processing instead of software such as Microsoft Word, and Spotify instead of CDs and MP3 players. What is another program or service that you think will move into the cloud? Why do you think technology is moving in the direction of cloud computing?**

10 minutes

Question 3

- **More and more programs and apps are being moved from being stored locally on individual computers to being in the cloud. For example, many people now use internet-based word processing instead of software such as Microsoft Word, and Spotify instead of CDs and MP3 players. What is another program or service that you think will move into the cloud? Why do you think technology is moving in the direction of cloud computing?**

Discussion

Activity 1

- Explain the purpose of a Region, Availability Zone, and edge location.
- Identify connections among Regions, Availability Zones, and edge locations.

30 minutes

Activity 2

- Recognize the types of cloud computing.
- Compare the types of cloud computing.

30 minutes

Scenario 1

- Doug likes to stream his gaming sessions. He has a server set up in his basement that he keeps cool using expensive air conditioners. He also spends a lot of time making sure that his servers are secure and working properly. He has also received feedback from his fans that his stream is very laggy when they are watching.

- **What types of cloud services could benefit the gamers in scenario 1?**

Scenario 2

- Tina and Grace enjoy writing stories together. Unfortunately, they live far apart and have to email each other their versions of the story as they add to them. This prevents them from working on a story simultaneously, and it creates a risk of losing track of the latest version.

- **What types of cloud services could benefit the writers who need to collaborate in scenario 2?**

Scenario 3

- Ana Carolina wants to develop her own mobile app for helping people in need get access to resources and services. The app will connect to existing maps and databases to find where and when services are available, and then send alerts to people who can use the services.

- **In scenario 3, what cloud services will help Sharon develop, run, and deliver her mobile app to those who need it?**

Scenario 4

- A group of friends like to meet online to play a role-playing game. They all need to be able to view the game manager's screen while talking and sharing video feeds with each other. The group also likes to save recordings of its sessions, to look back on if need be. These recordings can be very large files due to the long nature of a session.

- **In scenario 4, how will cloud services help the role-playing game group get the most out of their play sessions?**

Scenario 5

- A business called AnyCompany Power is installing smart power meters in homes to gather data about global energy usage. The meters connect to the web and provide data for when power usage increases and decreases. The company needs to store and analyze this giant amount of data to find patterns in energy usage that might improve efficiency and reduce waste.

- **In scenario 5, which cloud services will help the company to gather data and find patterns to reduce energy waste?**

Scenario 6

- A pediatrician with a private practice has so many patient files that she is running out of room in her filing cabinets. For this reason, she wants to move her data into the cloud. She wants to be sure the data is secure, but also wants her patients to be able to access their medical records and communicate with her online in a secure way. Describe one way that you can use each type of cloud service and how it would benefit her business.

Additional resources

- Types of Cloud Computing: This resource provides descriptions of IaaS, PaaS, and SaaS as they relate to AWS
- AWS Global Cloud Infrastructure video
- Global Infrastructure page
- Regions and Availability Zones site
- AWS Free Tier
- What is Cloud Computing?

Thank You

aws academy