**Module 1**

I'm Blaine Sundrud, AWS Training and Certification. I've been teaching technology for more years than I'm willing to admit. After spending time teaching the newspaper industry, I moved to AWS, where I've taught classes globally on many different disciplines, such as security, cloud architecture, DevOps, big data, AI and ML, and theater history. My momma was a teacher. My daddy was a teacher. My grandpa was a bartender. I was born for this.

Hi, I'm Morgan Willis, a Senior Cloud Technologist at AWS. I started in the IT world about 10 years ago. And along the way, I decided that I was missing something. I missed the help and teaching aspect of IT that I had in my first job in IT support. So, I went into teaching software development in different areas around the U.S. And then I eventually landed here at AWS, where, as a Cloud Technologist, I get to support others in their cloud journey every day.

And I'm Rudy Chetty. I come from sunny Cape Town, South Africa, home of biltong, boerewors, and bunny chow. I'm a Solutions Architect, and have been with AWS for over three years. Teaching is my passion. And I can't wait for you to dive into the course, and learn. Thank a lot. and good luck.

This course is gonna cover all the essential information that you need to understand, to be comfortable discussing AWS, to know why it's beneficial to your business.

AWS offers a massive range of services for every business, starting with basic elements, like compute, storage, and network security tools, through complex solutions like blockchain, machine learning, or artificial intelligence, and robot development platforms, all the way through very specialized tool sets, like video production management systems, and orbital satellites you can rent by the minute.

All that, however, is way more than we have time to cover in a foundational class like this one. So let's simplify the conversation by starting with the fundamental cloud compute model.

Almost all modern computing centers around a basic client-server model. Now I know it can be more complicated than that, so let's take a look at our coffee shop.

This coffee shop is going to give us some real world metaphors to help you understand why AWS can change the way your IT operates.

Let's make Morgan the server, the barista. And I am the client, the customer. I make a request. In this case, it is for coffee. Now in the computing world, the request could be anything. It could be rain pattern analysis in South Africa, or the latest x-rays of your knee, or videos of kittens. Whatever is the business, basically a customer makes a request, and with permissions, the server responds to that request. All I want is a caffeinated beverage.  
  
Morgan represents the server part of the client-server model. In AWS, she would be called an Amazon Elastic Compute Cloud, or EC2, an EC2 instance, a virtual server. So from an architectural point of view, the transaction we did is really simple to explain. I, the user, made a request to Morgan, the server. Morgan validated that the request was legitimate, in this case, did I give her money? Then she returned a response, which in this case, is a berry blaster with extra caramel shots.

Now in the real world, applications can get more complicated than just a single transaction with a single server. In a business solution that is more mature, it can get beautifully complex.

To avoid this complexity, we're going to start simple. We will build this discussion out so that it is easy for anyone to understand how these concepts build on each other. So, by the end, those complex concepts, they'll be easy to understand. Let's start with a key concept to AWS, and that is, you only pay for what you use.

This principle makes sense when you run a coffee shop. Employees are only paid when they're in the store working. If Rudy and Morgan are off the clock, well then they don't get paid. The store owner simply decides how many baristas are needed and then just pays for the hours they work. For example, the coffee shop is about to release a new drink, the Pumpkin Monster Spice. In anticipation of this launch, you could always staff your shop with a dozen baristas all day long, just in case you suddenly get an unexpected rush at some point in the day. Only, let's be honest. For most of your day, you don't have near enough customers to justify paying for all those employees.

And yet, the is exactly what happens in an on-premises data center. You can't just snap your fingers and triple your capacity. At AWS, you don't pre-pay for anything. And you don't have to worry about capacity constraints.

When you need instances, or baristas, you just click a button, and you have them. And when you don't need them, another click, and they go away, and you stop paying for them. The same way you don't pay for employees for hours that they're not working.

So, pay for what you need, becomes the first key value of many for running your business on AWS. And that is really why we're here, to help you understand how AWS is built to help you run your business better.

We hope you stick around for the entire course, as we dive deeper into these concepts, and help launch you on your journey to being a Cloud Practitioner.

Topic 1: Introduction

**Learning objectives**

In this module, you will learn how to:

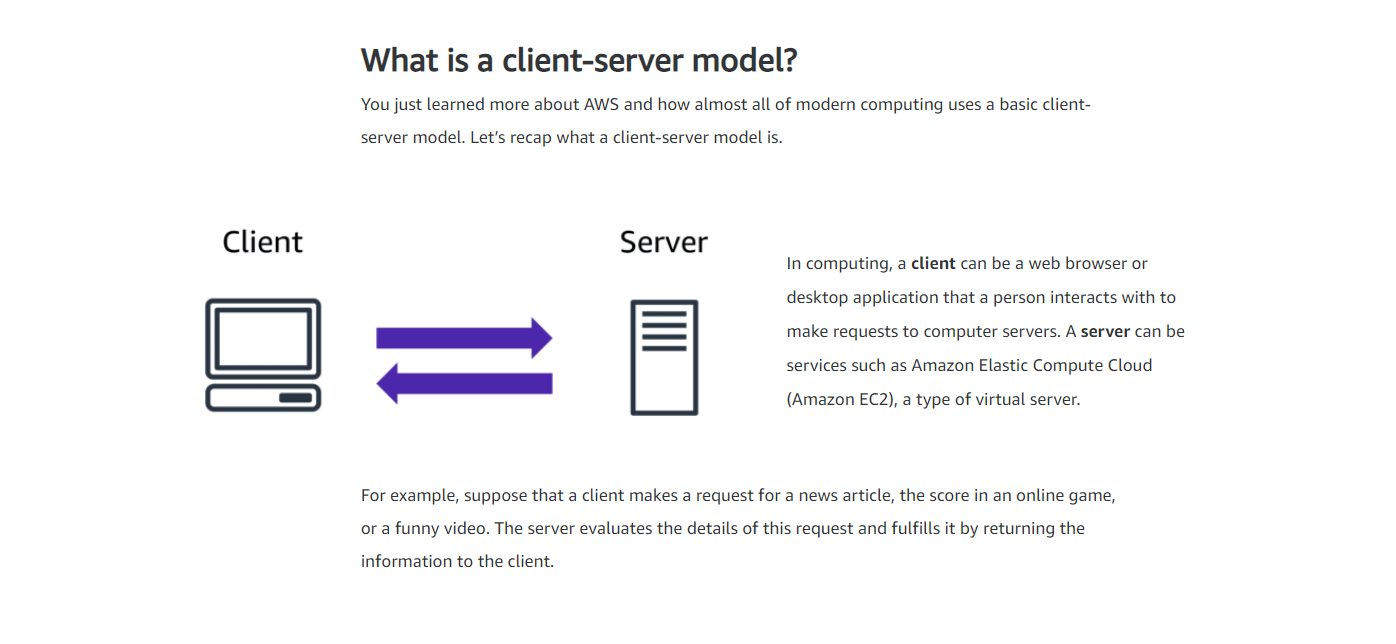
* Summarize the benefits of AWS.
* Describe differences between on-demand delivery and cloud deployments.
* Summarize the pay-as-you-go pricing model.

Service Offerings:

1. Compute
2. Storage
3. Network security
4. Blockchain
5. Machine learning
6. Artificial intelligence
7. Robot development
8. Video production
9. Orbital satellites

Amazon Elastic Compute Cloud AEC2 (Virtual Server)

Key Values: Pay for what you need



Topic 2: Cloud computing

Before we get deeper into the pieces and parts of AWS, let's zoom out and get a good working definition of cloud. Cloud computing is the on-demand delivery of IT resources over the internet with pay-as-you-go pricing. Let's break this down. On-demand delivery indicates that AWS has the resources you need, when you need them. You don't need to tell us in advance that you're going to need them. Suddenly you find yourself needing 300 virtual servers. Well, just a few clicks and launch them. Or you need 2000 terabytes of storage. You don't have to tell us in advance, just start using the storage you need, when you need it. Don't need them anymore, just as quickly, you can return them and stop paying immediately. That kind of flexibility is just not possible when you're managing your own data centers.

The idea of IT resources is actually a big part of the AWS philosophy. We often get asked why AWS has so many products and the answer is really simple: Because businesses need them. If there are IT elements that are common across a number of businesses, then this is not a differentiator.

Take a MySQL database as an example. If your business runs a MySQL database, does your ability to install the MySQL engine make you a better company than your competitors? Well, probably not that. Do you keep backups in a way that makes you superior to other players in your vertical? Again, doubtful. The data inside your database, now that's critically different. The way you build your tables and manage the structures, absolutely separates you from the competition. But the engine is just the engine.

At AWS, we call that the undifferentiated heavy lifting of IT. Tasks that are common, often repetitive and ultimately time-consuming; these are the tasks AWS wants to help you with. So you can focus on what makes you unique. Over the internet, seems simple enough, but it implies that you can access those resources using a secure webpage console or programmatically.

No additional contracts or sales calls are needed. With pay-as-you-go pricing, we re-emphasize what we pointed out here in the coffee shop. You don't staff a shop with employees 24 hours a day at the same levels you do during peak hours. In fact, some hours, you might not even staff them at all. So why pay for developer environments, for example, on weekends, if your developers aren't working on the weekends?

Its on-demand delivery of IT resources over the internet with pay-as-you-go pricing

Undifferentiated heaving lifting of IT.. tasks that are common, repetive and ultimately time-consuming

**Deployment models for cloud computing**

When selecting a cloud strategy, a company must consider factors such as required cloud application components, preferred resource management tools, and any legacy IT infrastructure requirements.

The three cloud computing deployment models are cloud-based, on-premises, and hybrid.

Select each tab to learn about each category.

ONE: CLOUD-BASED DEPLOYMENT

* Run all parts of the application in the cloud.
* Migrate existing applications to the cloud.
* Design and build new applications in the cloud.

In a **cloud-based deployment** model, you can migrate existing applications to the cloud, or you can design and build new applications in the cloud. You can build those applications on low-level infrastructure that requires your IT staff to manage them. Alternatively, you can build them using higher-level services that reduce the management, architecting, and scaling requirements of the core infrastructure.

For example, a company might create an application consisting of virtual servers, databases, and networking components that are fully based in the cloud.

TWO: ON-PREMISES DEPLOYMENT

* Deploy resources by using virtualization and resource management tools.
* Increase resource utilization by using application management and virtualization technologies.

**On-premises deployment**is also known as a *private cloud* deployment. In this model, resources are deployed on premises by using virtualization and resource management tools.

For example, you might have applications that run on technology that is fully kept in your on-premises data center. Though this model is much like legacy IT infrastructure, its incorporation of application management and virtualization technologies helps to increase resource utilization.

THREE: HYBRID DEPLOYMENT

* Connect cloud-based resources to on-premises infrastructure.
* Integrate cloud-based resources with legacy IT applications.

In a **hybrid deployment**, cloud-based resources are connected to on-premises infrastructure. You might want to use this approach in a number of situations. For example, you have legacy applications that are better maintained on premises, or government regulations require your business to keep certain records on premises.

For example, suppose that a company wants to use cloud services that can automate batch data processing and analytics. However, the company has several legacy applications that are more suitable on premises and will not be migrated to the cloud. With a hybrid deployment, the company would be able to keep the legacy applications on premises while benefiting from the data and analytics services that run in the cloud.

**Benefits of cloud computing**

* **Trade upfront expense for variable expense**

Upfront expense refers to data centers, physical servers, and other resources that you would need to invest in before using them. Variable expense means you only pay for computing resources you consume instead of investing heavily in data centers and servers before you know how you’re going to use them.

By taking a cloud computing approach that offers the benefit of variable expense, companies can implement innovative solutions while saving on costs.

* **Stop spending money to run and maintain data centers**

Computing in data centers often requires you to spend more money and time managing infrastructure and servers.

A benefit of cloud computing is the ability to focus less on these tasks and more on your applications and customers.

* **Stop guessing capacity**

With cloud computing, you don’t have to predict how much infrastructure capacity you will need before deploying an application.

For example, you can launch Amazon EC2 instances when needed, and pay only for the compute time you use. Instead of paying for unused resources or having to deal with limited capacity, you can access only the capacity that you need. You can also scale in or scale out in response to demand.

* **Benefit from massive economies of scale**

By using cloud computing, you can achieve a lower variable cost than you can get on your own.

Because usage from hundreds of thousands of customers can aggregate in the cloud, providers, such as AWS, can achieve higher economies of scale. The economy of scale translates into lower pay-as-you-go prices.

* **Increase speed and agility**

The flexibility of cloud computing makes it easier for you to develop and deploy applications.

This flexibility provides you with more time to experiment and innovate. When computing in data centers, it may take weeks to obtain new resources that you need. By comparison, cloud computing enables you to access new resources within minutes.

* **Go global in minutes**

The global footprint of the AWS Cloud enables you to deploy applications to customers around the world quickly, while providing them with low latency. This means that even if you are located in a different part of the world than your customers, customers are able to access your applications with minimal delays.

Later in this course, you will explore the AWS global infrastructure in greater detail. You will examine some of the services that you can use to deliver content to customers around the world.

Resources:

<https://docs.aws.amazon.com/general/latest/gr/glos-chap.html>

<https://d0.awsstatic.com/whitepapers/aws-overview.pdf>

<https://aws.amazon.com/getting-started/fundamentals-overview/>

<https://aws.amazon.com/what-is-cloud-computing/>

<https://aws.amazon.com/types-of-cloud-computing/>

<https://aws.amazon.com/what-is-aws/>