AWS for Beginners

The ultimate guide to the fundamentals of AWS

STEVE M. BURNETT

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AMAZON WEB SERVICES FOR BEGINNERS

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ABOUT THE AUTHOR

CHAPTER ONE

INTRODUCTION OF AWS

What is AWS?

AWS means Amazon Web Services that is used by millions, and to get the answer to this question, we must know that AWS is a cloud provider. It is a safe cloud services platform that offers almost all that a business requires to develop sophisticated applications with reliability, scalability, and flexibility. It is a model for billing generally referred to as “pay-as-you-go,” having no upfront or capital cost. Amazon offers almost 100 services based on-demand, and the list has been rising daily. Operation is almost immediately, and it’s accessible with reduced setup.

To master AWS is not all about the online building of sites. The service affords developers access to an interconnected set of attributes offering calculated database storage, power, content delivery, and an increasing portfolio of connected functionality. Organizations around the globe use AWS to develop and scale. Cloud computing has come to remain, and the available solutions from AWS are fast-tracking its development.

Overview of AWS

Cloud computing is now an essential part of all businesses in every industry. Amazon Web Services is a prevalent form that increases efficiency while assisting several business practices. Dating back to the 2000s, organizations depended absolutely on servers that are purchased servers. In contrast, such servers had functions that are limited with steep prices, including a server that is functioning requiring numerous validations.

The more business keeps experiencing growth, the more optimization practices and servers are needed. Getting such items showed unproductively and at times excessively costly.

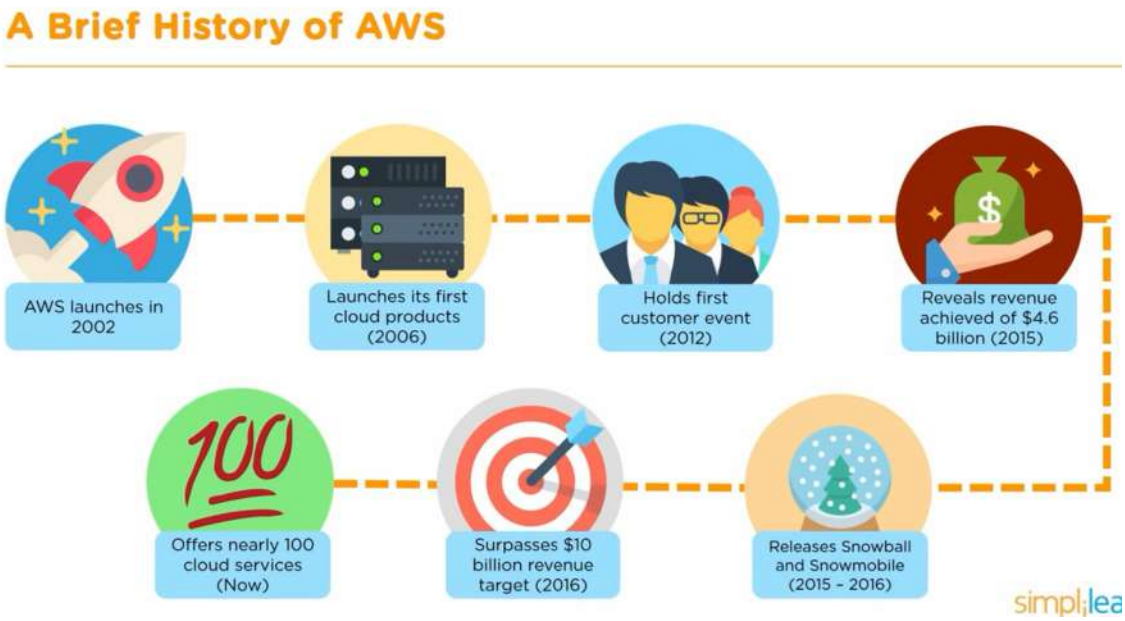
The benefits of Amazon Web Services have been the answer to many problems. Organizations that use AWS have instantly available servers; also, AWS offers various improved storage options, workloads, and enhanced security measures.

History of AWS

Amazon Web Services was launched in 2002. The company intended to sell the infrastructure that is not in use as a service or offering it to customers, wherein the purpose was met enthusiastically. Amazon had its first AWS product launched in the year 2006. After four years, in the year 2012, Amazon had a huge occasion to gather customer input concerning AWS. To date, the organization continues to hold similar events, like Reinvent, that lets customers share feedback concerning AWS.

In 2015, Amazon publicized that the revenue of AWS has amounted to $7.8 billion. From then and 2016, measures had been launched by AWS aiding customers to migrate their services to AWS. Such actions, including the growing and appreciating features of AWS, made further economic growth. In the year 2016, Amazon’s revenue augmented to $12.2 billion in 2016. Presently, AWS provides customers with 160 products and services. The number is liable to

increase, owing to the rate at which Amazon builds upon and fine-tunes AWS.



Who Uses AWS?

The number of organizations under the umbrella of AWS via IT environments is more like assessing globally successful organizations.

Using AWS, Adobe provides multi-terabyte working environments accessible by its customers by integrating the system using AWS Cloud. Adobe focuses on operating and organizing its software rather than putting effort to manage and deploy the infrastructure.

Airbnb, an online connected vacation rental marketplace for property owners and explorers to connect, sustains an enormous infrastructure in Amazon Web Services while using almost all accessible services.

Autodesk is developing software for the entertainment industries, engineering, and design. With the use of services such as Amazon S3 and Amazon RDS, Autodesk can increase its tools for learning machines rather than spending much time on infrastructure management.

America Online (AOL) uses AWS to close data centers, economize, and withdraw almost 14,000 co-located and in-house servers.

BitDefender is a firm that has internet security software whereby its software portfolio comprises anti-spyware and antivirus products. While using Amazon EC2 that is running various hundred cases handling data of about five terabytes. It also uses a feature known as Elastic Load Balancer to balance the load connection coming into those occurrences across accessibility zones, providing unified service delivery globally.

BMW uses AWS for its novel application for car connection, taking sensor data from BMW 7-series cars to enable drivers to assess map information dynamically.
With Amazon Web Services' use to distribute cloud-based services like office imaging products and mobile print, Canon's imaging products division tends to benefit from quicker deployment times, global accessibility, and lower cost.
Comcase uses AWS, the largest cable company globally and the United States' leading internet service provider for scalable hybrid infrastructure and flexibility.
Though more of the European Space Agency's work uses satellites, few of its data storage and computing infrastructure are developed on AWS.
The Guardian newspaper vastly uses AWS services to control an analytic dashboard primarily used by editors to view trending stories in recent times.
Amongst the world's leading business for news organizations is the Financial Times and uses Amazon Redshift for performing its analysis. Redshift can perform its analysis as fast as possible; some even thought it was malfunctioning. They were accustomed to the overnight running of queries. The Times, therefore, discovered that results were accurate, although much faster.
General Electric (GE) is presently migrating over 9,000 workloads and 300 disparate systems of ERP – to Amazon Web Services by reducing its data center footprint from 34 to four by 2021.
The list is endless, for example, McDonald's, Kellogg's, NASA, Howard Medical School, to mention but a few are profiting from AWS.

Why is AWS so Successful?

According to various reports from companies, principal aims for not only choosing AWS somewhat depending on it for vital measures of their IT infrastructure:

1. **Security and durability** :- Amazon Web Services encodes various data, presenting end-to-end confidentiality, including storage.
2. **Experience** :- Designers can depend on Amazon's reputable procedures. Including their techniques, tools including recommended top practices are made due to years of experience.
3. **Flexibility** :- There is excessive elasticity in Amazon Web Services, letting designers choose the OS language and database.
4. **Ease of Use** :- Amazon Web Services is easy to use. Designers can quickly organize and host apps, construct a novel, or even migrate existing apps.
5. **Scalability** :- Apps can easily be scaled up or down but, to an extent, depends on user desires.

6. **Cost savings** :- Organizations pay for the computing power, including usage of resources and storage, using no lasting commitments.

Services that are commonly used and provided by

Amazon Web Services

Various services available on AWS cannot be overemphasized; they are security, tools development, migration, custom engagement, storage, and many more. Below are some of the services that are commonly used by Amazon Web Services:

1. Amazon EC2 :- EC2 can be resettable due to the user's necessity, as long as a secured computing capacity is available in the cloud. For example, in situations whereby web traffic changes, this facility can increase its atmosphere, behind the scenes, to three occurrences when necessary and then contract to a single resource when weight reduces.

2. Amazon Elastic Beanstalk:- It consists of several programming languages; such service enables scale and organizes web apps. Just upload the required code, and the Elastic Beanstalk would automatically handle the setting from the capacity provision to load balancing and auto-scaling to app health checking.

3. Amazon Lightsail - Easy to present and manage, Amazon Lightsail is essentially a confidential server and contains all required to launch a project without delay on a computer-generated machine, such as tools for transferring data, SSD-based storage, static IP, and DNS management.

4. Amazon Lambda :- It enables organizations for code running with no use for server management and provisioning. It automatically scales little requests for a day to so many for a second. Organizations pay for the time used for computing and no charges while code isn't running.

Amazon Web Services Storage Services

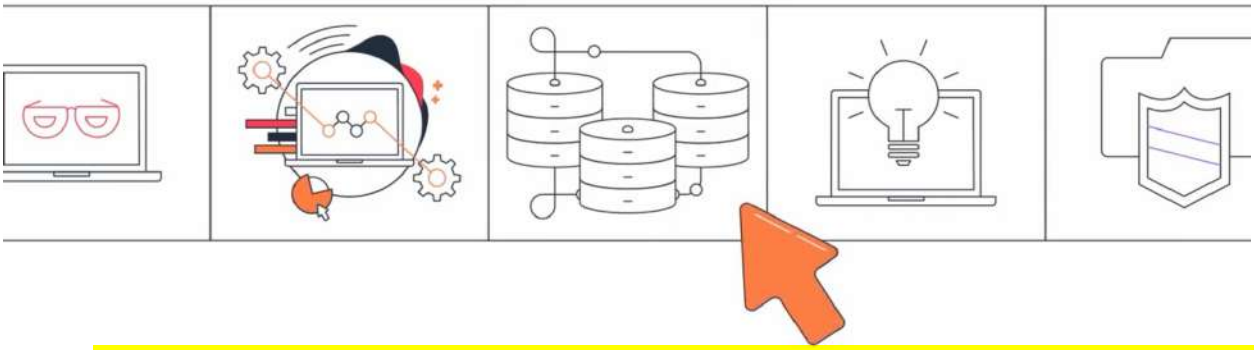
With the quantity of data organizations collect, storing the data seems to be high in demand. AWS, therefore, helps bring numerous solutions listed below:

- **Amazon S3** – With S3, data can be stored and retrieved from anywhere, including IoT sensors, mobile apps, websites, and others. There's flexibility in data management, security, and durability for internet storage.
- **Amazon Glacier** – It's a service for cloud storage meant for storing data for future use, including long-term backups, highly secure options, and low-cost Glacier.
- **Amazon Elastic Block Store (EBS)** - EBS offers block store volumes for cases of EC2. It is a dependable storage volume attached to whichever running instance in a similar accessibility zone.
- **Amazon Elastic File System (EFS):** - EFS can be used with the Amazon Web Services Cloud resources and services. It's scalable and straightforward; it's flexible storing of files for on-premise resources. Containing an intuitive interface allows users to build and file configuring systems without troubling the app growth and automatic shrinking when files are being added or even removed.

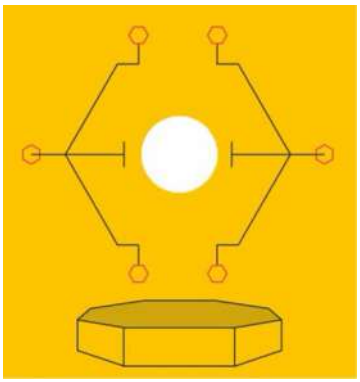
Amazon Web Services Databases

Amazon Web Services offers databases in dual primary flavors:

- **Amazon RDS** - Easing the process of setting up, operating, and scaling a relational database in the cloud, Amazon RDS provides cost-efficient and resizable capacity while automating time-consuming administrative tasks such as database hardware setup, repairing, and backups. The enhanced service is for memory performance and output/input processes. Amazon RDS gives you the freedom to use your relational database of choice including the most popular open source and commercial agents and amazon relational database built for the cloud, Amazon Aurora, which offers the performance and availability of traditional commercial databases and fraction of the cost. RDS enables you to scale across a global footprint of data with enterprise high availability and disasater recovery no matter the size, it automates many previous cumbersome task, automatic failover, backups at point in time are restored, disaster recover, access management, encryption, secure networking, monitoring and performance optimization. All these and more can be enabled with a few clicks or API codes. Even, highly regulated industries can leverage RDS which means a broad range of compliance certifications.



- **Amazon Redshift** is a data warehousing service allowing users to examine data with SQL and other intelligence business instruments. It can be used in running multifaceted queries compared to terabytes of organized data and obtain results in seconds.



The Future of AWS

As business and artificial intelligence, including IoT, evolve and indeed come into existence on their own, the necessity for data storage, cloud computing, and security would evolve to new levels. Additional services can be developed in the cloud, such as financial markets, healthcare, and other industries that will become more reliant on these technologies. Gratefully, AWS is out and remains to develop scalable and easy solutions for deploying and managing web apps in the cloud. It is evident that there's a bright future and that this cloud has a silver lining.

Suppose you're ready to be a part of the future of AWS. In that case, there's a certification course from Simplilearn that would prepare you to be an industry-ready, in-demand AWS solutions architect, with the privilege of firsthand experience with the management of AWS. You will study how IT architecture rules are redefined by cloud computing and how to scale and design Amazon Web Services cloud operations with Amazon's recommended best practices.

Services of AWS

Since its existence, AWS has developed into a vital technological cloud computing. Below are some essential services offered by AWS:

1. **Amazon S3**

It is a tool used for backing up the internet and less costly for storage options in the category of object-storage. The central part of this option is that data stored can be retrieved from virtually anywhere they are needed.

2. **AWS Data Transfer Products**

As the term suggests, they are collecting data, transferring data products, and migration that aids the collection of data seamlessly. They can also allow the monitoring and analysis of data in actual time.

3. **Amazon EC2 (Elastic Compute Cloud)**

It provides a resizable and secured capacity for computing, depending on your requirements. The service, therefore, is designed to enable web-scale cloud computing more reachable.

4. **Amazon SNS (Simple Notification Services)**

It is a tool for delivering notification messages to a significant number of subscribers via SMS or email. Alarms can be sent, including service notifications and other messages proposed to call attention to important information.

5. **Amazon KMS (Key Management System)**

It is a security instrument using 256-bit encryption for data. Also safeguarding it from cybercrime/attacks and hackers.

6. **Amazon Lambda**

It's for code running depending on a particular event and manages reliant resources. You do not need either provisioning servers or operating, and how much is paid depending on the length of time, it takes in executing your code. It's cost-effective, unlike services that their charges are according to hourly rates.

7. **Route 53**

It is a DNS service in the cloud that doesn't need you to keep a separate DNS account. The aim is to provide a cost-effective and reliable method to route users for businesses to internet apps.

Advantages of Amazon Web Services

Unilever, a well-known organization in the world of consumer goods, would be used as an illustration.

Unilever had an issue: It required a quicker time-to-market and a consistent environment, and it's spread across 190 countries and uses digital marketing for its products. Its prevailing legacy in the local climate proved unworkable, incapable of catering to altering IT demands.

It then moved a portion of its business to Amazon Web Services, and ever since, rollouts have been smooth, provisioning apps have become dependable, and even infrastructure provisioning has increased.

The company can also do everything in scaling push-button and Amazon Web Service's backups that are secured to ensure that all company's data is accessible continuously and secured.

Unilever is currently developing with Amazon Web Services, kudos to characteristics like rapid rollouts deployment, capacity to produce current reports and securing backups.

Why Use AWS?

Below are the distinctive features that make Amazon's AWS a leader in the cloud market worldwide.

1. **Improved Security**

AWS creates a technological platform that is secured and long-lasting. To ensure that your data is secured and reliable, Amazon's data services and centers have different operational and physical security layers. Amazon Web Services also carry out audits regularly to make sure of the security of the infrastructure.

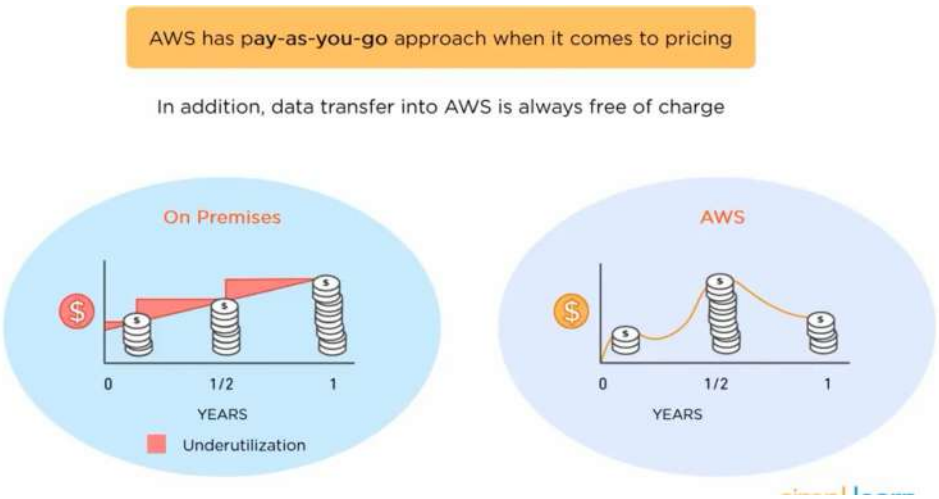
They're also best practices implemented in security and certification offers on ways to deploy AWS security features. There's the assurance of confidentiality, availability, and integrity of your data while providing end-to-end security and privacy.

In terms of cloud security provided by Amazon's AWS, they are earnest about it. Their recent addition to security services is called the Amazon Detective, making data investigations more efficient and even faster.

2. **Cost-Effectiveness**

A very distinguished advantage of AWS that is promising is the pay-as-you-go pricing model. It means that you pay only for a particular service you subscribed to, and it's only for that specific time you need it. It is a step ahead towards a smart-driven product for organizational development.

Amazon Web Services pricing is related to means through which you pay for utilities such as electricity and water. Therefore, you can pay only for consumed services and immediately discontinue their use, and termination fees or extra costs will not be included.

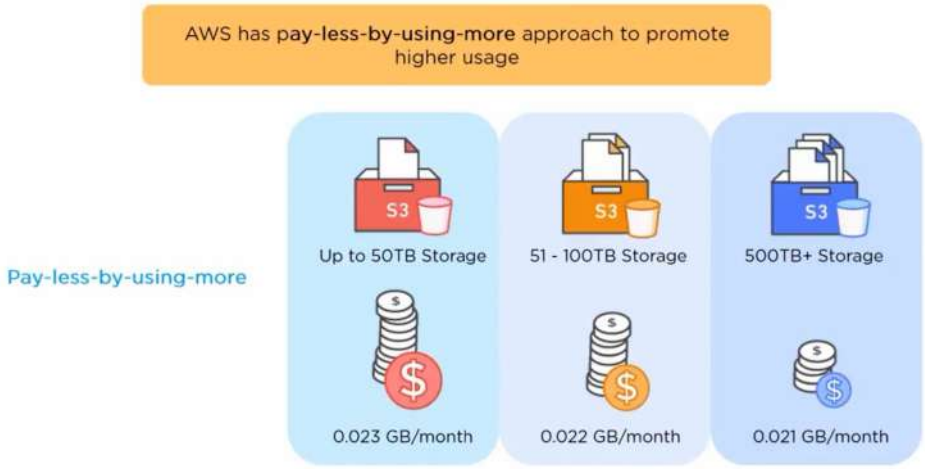


– Amazon AWS

There are other policies available that are valid for a particular Amazon Web Services. Here is some indication to enable you to comprehend which Amazon cloud computing cost plan will be paramount for your company.

Save when you Reserve : The suggestion holds specific good services, including Amazon RDS and Amazon EC2. At this point, the real cost is rightly related to the discount accumulated, i.e., if you choose the pay, the total price up-front, then you'll get the extreme discount and vice-versa.

Pay Less by Using More : For particular AWS services like S3 or data transfer OUT from EC2, the more the usage, the less you pay per Gigabyte (GB). These are volume-based discounts that enable you to profit in the long run.



AWS Free Tier : Upon creating a new account, over 60 AWS services can be accessed and freely offered. Nevertheless, these free offers are subdivided into three offers depending on the form of product an organization intends to use.

3. **Flexibility and Openness**

AWS is an agnostic-platform for operating languages and systems. You can choose the development platform or programming model that can be more favorable to your business.

Businesses are entitled to a potential environment that allows them to access services and software required by a specific application. Hence, no limitations or strict protocols while subscribing to Amazon cloud services that aid migration and enable the building of new solutions.

Furthermore, programming languages can be used, including databases, architectures, and programming languages you are accustomed to. In like manner, there won't be any requirement for your IT personnel to pick up a set of new skills, and the total time to market and productivity will considerably increase.

4. **Scalability and Elasticity**

Amazon Web Services allows you to experiment, innovate and iterate speedily via a huge cloud global infrastructure. Therefore, in leveraging scalability, Amazon Web Service can effortlessly manage the increase of workload by assigning the resources as a result of the demand, that also within minutes. New applications can as well be used instead of waiting for months for hardware while avoiding resource provisioning upfront for projects with lifetimes that are short and variable rates consumption.

Illustrating Scalability- Low demand vs. high demand

AWS can allocate resources via API calls instead of buying hardware, maintaining, and setting it up to assign resources to apps.

Illustrating elasticity- Low demand vs high demand

Elastic load balancing and auto-scaling can automatically measure up Amazon cloud-based resources in the event of an unexpected rise in demand and scaling

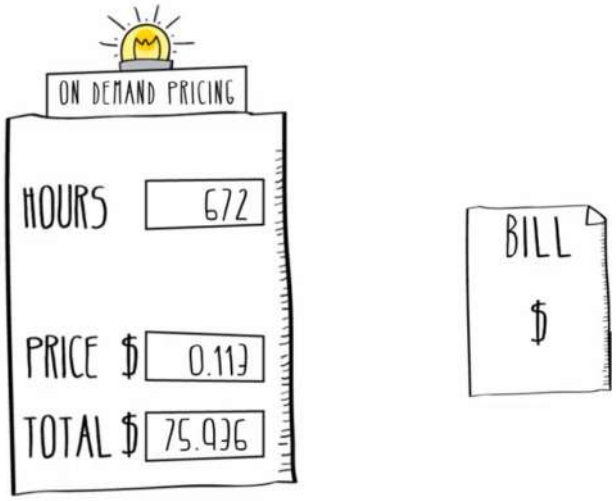
them down whereby need is reduced. The Amazon Web Services cloud is also proved to be useful for recurrent jobs at consistent intervals, jobs that are difficult to accomplish, and short term jobs.

CHAPTER TWO

AWS EC2

What is AWS EC2, and why are Businesses Choosing it?

Amazon Elastic Compute Cloud (Amazon EC2) gives scalable computing capacity in the AWS cloud. Through Amazon, your requirements are eradicated to participate in upfront hardware, so faster apps can be developed and deployed. Whatever applications you run, you definitely would require services, sometimes you might need more while sometimes you may not, whatever your requirements, it would be great to obtain services quickly and inexpensively. Traditionally, obtaining services could be stressful, EC2 therefore makes it easy to obtain a virtual service quickly and inexpensively by choosing the exact type you want and the template you prefer to use. This could be done with a few clicks. EC2 also offers a flexible pricing option by paying for only what you use, when you stop your instances, you stop paying (on-demand pricing).



Announced in 2006, EC2 (Elastic Compute Cloud) allows you to use Amazon's computing environment and control your complete computing resources. You can speedily scale capability based on the computing requirements as Amazon EC2 enables you to acquire and boot new server instances in a few minutes.
It safeguards against common occurrences of failure and offers developers the equipment to advance mobile apps that are tough. A good example is GE Appliances, which has consistently been increasing with these EC2 cases' aid.

Noticeable Characteristics of Amazon Web Services EC2?

AWS EC2 has different attributes that aid the development of scalable applications and enterprise-class, that are tough to failure. Below are some of them:

1. **Amazon Elastic Block Store (EBS)**

EBS offers consistent storage for cases of Amazon EC2. Amazon EBS volumes are committed to the network and even without being dependent on a case's life. They can be attached as a standard block device to running an Amazon EC2 case or used as the boot division of an Amazon EC2 case and are incredibly dependable.
While using Amazon EC2 as a boot division, AWS EC2 instances can stop and restart as needed. In a particular accessibility zone, Amazon EBS volumes are duplicated automatically.

2. **EBS-Optimized Cases**

A few selected Amazon EC2 types of cases can be launched as EBS-optimized cases for a reduced hourly fee. EBS-
You can launch a few chosen Amazon EC2 instance types as EBS-optimized instances for a low hourly price. EBS-enhanced cases make it possible for EC2 cases to utilize the IOPS provisioned on an EBS volume. Depending on the type

of illustration used, throughput anywhere between 425 Mbps and 14,000 Mbps can be provided by EBS-optimized instances between Amazon EC2 and Amazon EBS.

3. **Elastic IP Addresses**

Static IP addresses which can be used for active cloud computing are known as a flexible IP address. A flexible IP address isn't related to a particular instance, but with your account and till you let go of it, the address can be controlled.

Through the remapping of your public IP addresses programmatically to whichever case in your account, flexible IP addresses allow you to mask availability zone failures or issues.

Amazon EC2 allows you to work around matters with software or cases whereby you don't rapidly map your flexible IP address to the point of replacement. Therefore, you don't have to delay DNS to spread to all customers or hold on for a data technician to reconfigure or substitute your host.

4. **Amazon Virtual Private Cloud**

A virtual network can be defined whereby you can launch AWS cloud resources that can be performed via a section of the AWS cloud separate from the aid of Amazon VPC. Route tables, network gateways, and creating subnets, and choosing your IP address variety can be configured. This is because the virtual networking environment can be controlled entirely via Amazon VPC.

A hardware virtual private network (VPN) can also be created, which connects your corporate data center and VPC in using AWS cloud as an expansion of the corporate data center.

5. **Amazon CloudWatch**

Beginning with Amazon EC2, Amazon CloudWatch observes Amazon cloud resources and apps. Writes, network traffic and disk reads, and CPU operation are amongst the metrics provided by Amazon CloudWatch for reflectiveness into general patterns of demand, resource utilization, and functioning performance.

Alarms can be set, statistics can be gotten, and graphs can be viewed for your metric data. All you've to do is select the Amazon EC2 cases you wish to be monitored to use Amazon CloudWatch. Also, you can provide your app or data for a business metric. Amazon CloudWatch will gather and store data easily accessed using command line equipment and AWS APIs.

6. **Auto Scaling**

In agreement with the situations outlined, auto-scaling allows you to measure the capacity of your Amazon EC2 both up and down. There is cost reduction for the duration of lulls or spikes in demand via auto-scaling that scales up automatically or scales down the instances of the Amazon EC2 you are using.

For applications undergoing hourly, daily, or weekly usage variability, automatic

scaling is very appropriate. Amazon CloudWatch allows automatic scaling and will enable you to pay only for what you use.

7. **Elastic Load Balancing**

It automatically assigns incoming app traffic to numerous Amazon EC2 cases. Replying to incoming app traffic, elastic load balance offers the load balancing ability needed to aid you in getting better tolerance for errors in your applications.

Elastic load balancing notifies traffic to strong cases until the cases that are not solid are repaired. For mobile applications' routine, elastic load balancing can be allowed within single or more accessibility zones.

Request inactivity and count are the functioning metrics that can be captured with Amazon CloudWatch. Furthermore, you don't need to pay for anything other than the fees charged for elastic load balancing.

Airbnb uses Elastic Load Balancing that automatically distributes inward traffic among multiple Amazon EC2 cases

8. **Auto Recovery**

Automatic retrieval is an Amazon CloudFront EC2 characteristic that regains automatically every supported case. If case system damage is identified, it is a stress-free task enabling the automatic feature by constructing an AWS CloudWatch alarm. An additional perk of this characteristic is that it streamlines its capability to preserve a case running when the case gets improved on the new hardware. Therefore, instant migration is no longer needed.

9. **Improved Networking**

The characteristic of the EC2 improves the packet for a second performance, alongside the provision of lower latencies and network jitter. Improved networking exploits a new network virtualization stack holding power to give effective I/O implementation and reduced CPU deployment. All you have to do is to launch an HVM AMI in VPC while installing a well-matched driver.

10. **VM Import/Export**

These particular EC2 characteristics ease the import of simulated machine images from the cases of EC2 source and export to a similar source at any agreed time. Also, you can export any case of EC2 import previously imported each time the need arises. Nevertheless, there is a standard usage threshold further that there are extra charges to use the service.

11. **High-Performance Computing (HPC) Clusters**

Organizations using the computational amount of work like app sensitive to network effects can be managed to accomplish the needed top performance with

the aid of these AWS EC2 characteristics. C5 cases are constructed to achieve network-intensive functions. They can be shared into clusters, thus giving a low-latency network function that is advanced required for tightly-coupled, node-to-node communication.

12. **Optimized CPU Configurations**

Benefits can be gotten from cost advantages, elasticity, and flexibility of Amazon EC2, also obtain the type of high computing performance and increased network obtained via custom-constructed infrastructure even with multifaceted computational workloads like applications sensitive to network

Applications can get reduced-latency network effectiveness required for node-to-node, firmly coupled communication by programmatically launching cluster compute cases, cluster GPU, and maximum memory into groups.

Maximum memory, cluster compute cases, and cluster GPU have been considered to offer top-performance network ability. Cluster cases are appropriate for customer apps essential in performing network-intensive processes and considerably provide improved throughput.

Benefits of Amazon EC2

After maneuvering over the plethora of characteristics that EC2 offers, here are some add-on profits to note.

1. **Simple to Begin With**

Getting on track with EC2 is quick and straightforward. All that is required is to choose pre-configured software on Amazon Machine Images (AMIs) by visiting the Amazon Web Services marketplace and begin immediately with Amazon EC2. Use the EC2 AWS support or via a one-click launch in installing the software.

2. **Web-Scale Computing With Elasticity**

Your app can automatically scale to-and-fro because Amazon EC2 is controlled through web service application programming interfaces (APIs). You can commission any number of server instances at the same time to increase or decrease capacity in a few minutes through Amazon EC2, which, in turn, makes it a good AWS service.

3. **Low Costing**

The financial aids of Amazon's scale are delivered to customers. The capacity for computing that you've used is what you pay for, and it's at a reduced rate. Though EC2 is cost-free to try, there're also some cases where you can choose to pay. Regardless, you can only pay for what you've selected to pay for, without any unexpected or concealed expenses.

4. **Complete Control**

You can interrelate with the cases as you can interact with whichever machine you have origin access for every one of them. So you regulate your AWS cases. Data can be saved on your boot partition while you stop a case and later restart it with the web service APIs. Through instances of rebooting remotely by web service APIs, your instance's console output can be accessed.

5. **Security**

Your computing resources are protected, and the networking functionality made robust by Amazon EC2 functioning with Amazon Virtual Private Cloud (Amazon VPC).

You choose the IP variety for the VPC through which your compute cases are positioned. You identify the cases that stay private and those visible to the internet.

As well, for more separation, your cases can be run on dedicated hardware. They are called dedicated instances and run on provisioned resources through EC2.

Standardized industry encrypted IPsec VPN connections can be used to connect resources in your VPC with an existing IT infrastructure.

You can regulate access to the network and from your cases via network access control lists (ACLs) and a group of security.

In leveraging private subnets, VPN connections, network ACLs, and outbound safety filtering collection, amongst other progressive networking characteristics, VPC can be created and introduced into it if you do not have an automatic VPC.

6. **Flexible Services for Cloud Hosting**

There are several software development packages and functioning system instance forms that you can choose via Amazon EC2. You can select a boot partition size appropriate for the functioning system and application you have in accumulation to case storage, memory configuration, and CPU via AWS EC2.

7. **Dependability**

Dependability aids in the speed and foreseeable replacement of cases via the environmental flexibility provided by AWS EC2. The service leverages Amazon's data centers and network infrastructure to offer 99.95% obtainability in all Amazon EC2 regions (in agreement with the Amazon EC2 service equal agreement).

8. **Works in Combination with Other AWS Components**

For selecting applications, Amazon EC2 affords computing solutions, query processing and provides storage through working in association with Amazon Simple Queue Service, Amazon Relational Database Service, Amazon Simple DB, and Amazon Simple Storage Service.

CHAPTER THREE

CLOUD COMPUTING

What is cloud computing?

In simple terms, Cloud computing is the distribution of on-demand computing services – from apps to storing and power processing, usually through the web and based on pay-as-you-go. It is the on-demand delivery of IT resources via the internet with pay-as-you go pricing, instead of buying, owning and maintaining physical data centers and servers, you can access technology services such as computing power, storage and database on an hours needed bases from a cloud provider like Amazon Web Services. Organizations of every size, types and industry are using cloud for a wide variety of cases such as data backup, disaster recovery, email, virtual desktops, software development and testing and customer based web applications. For example, health care companies are using the cloud to develop more personalized treatment for patients, financial services companies are using the cloud to power real-time fraud detection and prevention and video game makers are using the cloud to deliver online games to millions of players around the world. With cloud computing, your business can become more agile, reduced cost, instantly scaled, and deploying globally in minutes. It gives you instant access to a broad range of technologies so you can innovate faster and there will be anything you can't imagine from infrastructure services such as compute storage and databases, data analytics to data analytics and lot more. You can deploy technological services in a matter of minutes and get ideas. It gives you the freedom to experiment and testing ideas to differentiate customer's experiences and transform your business such as adding machine learning and intelligence to your apps in order to personalize experience for your customers and improve their engagements. You don't need to make large up-front investments and hardware and over pay for capacity you don't use instead you can trade capital expense for variable expense and only pay for IT as you consume it.

How does cloud computing work?

Instead of maintaining a personal computing structure or data centers, an organization can access anything from apps to storage from a provider of cloud service.

An advantage of using cloud computing services is that companies may dodge the cost ahead and difficulty owning and sustaining their own IT infrastructure, but instead pay for whatever they use, anytime they use it.

Sequentially, cloud computing services providers can gain from vital economies of scale by distributing similar services to more customers.

Examples of cloud computing?

Cloud computing supports a wide range of services. It includes customer service

such as Gmail or the cloud back-up of photos from your mobile phone, still to the services that enable large enterprises in hosting all their data while running apps in the cloud. Netflix depends on cloud computing services in running its video streaming service and its other business systems and having a total number of other companies.

Cloud computing is suitable for the original selection for several applications: software vendors are progressively giving their apps as services through the web instead of different products as they attempt to move to a subscription model. Nevertheless, there is still a possible downside to cloud computing, being that it can also bring in new risks and costs for firms using it.

Why is it called cloud computing?

A vital model backing up cloud computing is that where the service is located and other details like the operating system or hardware in which it is running, it is considered unnecessary to the user. With this in mind, the symbol of the cloud was hired from ancient telecoms network plans. The public telephone network (and advanced to the internet) was frequently symbolized as a cloud to signify that the doesn't matter – it was only a cloud of stuff.

This is, of course, an excessive simplification; for a lot of customers, locating their services and data is still a primary issue.

History of cloud computing

As a term, Cloud computing has been existing since the early 2000s. Still, then, the idea of computing-as-a-service has been everywhere for much, very long, dating back to the 1960s, wherein computer bureaus agencies would enable firms to rent time on a mainframe instead of having a person buy one.

The Personal Computer's rise replaced such 'sharing-time' service, making a computer very much affordable. In turn, by the increase of business data centers where organizations would stock vast amounts of data.

But the idea of renting access to the power of computing has reemerged again and again – in the app service suppliers, grid computing as well as utility computing of the early 2000s and late 1990s. This was accompanied by cloud computing, which took a grip with software development as a service and hyper-scale cloud computing suppliers like AWS.

Top benefits of cloud computing

Cloud computing is an excellent change from the outdated system business thinking about IT resources. Below are collective reasons motive firms are switching to cloud computing services:

1. **Cost**

Cloud computing removes the capital cost of purchasing software and hardware while setting up and running on-site datacenters—the stands of servers, the round-the-clock energy for power and chilling, and the IT specialists for handling the infrastructure. It improves quickly.

2. **Speed**

Many cloud computing services are given self-service and based on demand. Therefore, even vast sums of computing resources can be provided in no time, generally with only a limited mouse click, giving organizations room for elasticity and taking the burden off capability planning.

3. **Global scale**

An advantage of cloud computing services is the capacity to measure elasticity. In cloud speak, it has to do with distributing the exact amount of IT resources – for instance, additional or fewer computing power, bandwidth, storage right where required, and from the same geographical location.

4. **Productivity**

Typically, on-site data centers need a lot of "stacking and racking" – software patching, hardware setup, and other time-consuming IT management chores. Cloud computing eradicates the necessity for many such tasks, so IT teams would spend time getting more important business goals.

5. **Performance**

The most extensive cloud computing services work on a worldwide network of protected data centers that are often improved to the newest quick and effective computing hardware. It gives numerous advantages over a particular corporate data center and limited network inactivity for apps, and better economies of scale.

6. **Reliability**

Cloud computing enables backing up of your data, tragedy retrieval, and business stability easier and at a reduced amount because data can be reflected at several redundant sites on the cloud provider's network.

7. **Security**

A lot of cloud providers give a wide range of controls, technologies, and policies that supports your safety position

Many cloud providers offer a broad set of guidelines, technologies, and rules that strengthen your security posture overall, helping protect your data, apps, and infrastructure from potential threats.

Types of cloud computing

Not all clouds are the same, and not a kind of cloud computing is right for everyone. Several different models, classes, and services have evolved to offer the right solution for your needs.

First, you need to determine the type of cloud deployment, or cloud computing architecture, that your cloud services will implement. There are three different ways to deploy cloud services: on a public cloud, private cloud, or hybrid cloud. Learn more about public, private, and hybrid clouds.

1. Public cloud

Public clouds are owned and operated by third-party cloud service providers, which deliver their computing resources, like servers and storage, over the Internet. Microsoft Azure is an example of a public cloud. With a public cloud, all hardware, software, and other supporting infrastructure is owned and managed by the cloud provider. You access these services and manage your account using a web browser. Learn more about the public cloud.

2. Private cloud

A private cloud is a cloud computing resource used by one firm or business organization. It can be situated on a firm's on-site datacenter. Several firms also pay third-party service providers to host their private cloud. A private cloud is one that such infrastructure and services are preserved on a reserved network.

3. Hybrid cloud

Hybrid clouds bring together private and public clouds, putting together technology that enables apps and data to be divided among them. By allowing apps and data to move amidst public and private clouds, a hybrid cloud offers your business the opportunity for flexibility, additional options for deployment and enables the enhancement of your current infrastructure, compliance, and security.

Types of cloud services: PaaS, IaaS, SaaS, and Serverless

Many cloud computing services can be found in four extensive groups: platform as a service (PaaS), infrastructure as a service (Iaas), software as a service, and serverless. They are normally called the cloud computing "stack" since they construct above each other. Knowing what they signify and how different they are shows how easier to achieve your organization's goals.

1. Software as a service (SaaS)

It's a technique for distributing software apps through the web, on-demand, and characteristically based on subscription. With SaaS, cloud providers manage and host the software app and fundamental infrastructure, handling all maintenance

such as safety fixing and software upgrades. Users connect to an app through the internet, regularly with an internet browser on their tablet, PC, or phone and doesn't have to be downloaded on your PC.

2. Platform as a service (PaaS)

This has to do with a cloud computing service supplying an on-demand atmosphere for managing software apps, developing, delivering, and testing. PaaS is planned to enable developers to have a more comfortable and quick way to make mobile applications or web, and not minding managing or setting up the fundamental infrastructure of network, databases, servers, and storage required for the development.

3. Infrastructure as a service (IaaS)

The most fundamental group of cloud computing services. With IaaS, you can rent IT infrastructure, virtual machines (VMs), and servers, including operating systems, networks, storage – from a cloud provider based on pay-as-you-go.

4. Serverless computing

Intersecting with PaaS, serverless computing concentrates on creating a working application without consistently managing the infrastructure and servers needed to do so. The cloud provider collects the capacity planning, setup, and server management for you. Serverless architectures are incredibly accessible and event-driven, only with resources while a particular function or trigger arises.

Uses of cloud computing

You may not consciously know that you're using cloud computing right now, even if you're not conscious of it.

Peradventure, you use an online service to edit documents, send an email, play games, watch movies or TV, or save photos and other files. It's probably that

cloud computing is causing all to be possible behind the scenes. The primary cloud computing services are hardly a decade old. Still, previously a diversity of organizations – from little startups to worldwide corporations, government agencies to nonprofits – are taking up the developing tools for various reasons.
Below are uncommon instances of what's likely possible today with cloud services from a cloud provider:

Create cloud-native applications

Swiftly deploy, construct, and scale apps—API, web, and mobile. Enjoy the benefits of cloud-native approaches and technologies, like containers, microservices architecture, Kubernetes, DevOps, and API-driven communication.

Test and build applications

Decrease time and cost for app development through cloud infrastructures that can simply be scaled up or down.

1. Backup, Store, and recover data

Safeguard your data on a more cost-efficient and massive scale when you transfer your data through the internet to an offsite cloud system that is reachable from anywhere and any device.

2. Analyze data

Unite your data through locations, divisions, and teams in the cloud. Then use cloud services like artificial intelligence and machine learning to reveal insight for more knowledgeable decisions.

3. Stream audio and video

You can be connected to your audience anytime and anywhere through any device with high-definition audio and video with worldwide distribution.

4. Embed intelligence

Use smart models to aid the engagement of customers while providing practical insights from the captured data.

5. Deliver Software on demand

Deliver Software on the market is also referred to as Software as a service (SaaS); on-demand Software allows you to offer the recent software versions and updates to customers—anytime they require it and anywhere they can be found.

How to choose a cloud provider

Microsoft and cloud computing

Microsoft is a global well-known cloud computing services provider for firms of various sizes.

Why Every Business Needs to Embrace Cloud Computing

You can see that taking the cloud is an excellent idea. It can be the main thing for your own business or IT management operations. A lot has been said about how information is even saved, accessed, and analyzed with cloud-based technology nowadays. Some of the entertainment we enjoy and the messaging platforms we get in touch with are driven by cloud-based technology.

The movie you saw last night in your comfort zone at home and the email you just got via your phone perhaps all came via a cloud. Therefore, we're already using cloud-based systems in our daily living. Nevertheless, it doesn't mean that cloud-based technology is any less strange for an average person. What is the cloud?

An average small, medium-sized firm may not understand the concept of cloud computing and its importance. Therefore, there is no doubt that every organization does require it. Money, manpower, and time can all be reserved when cloud-based solutions are at play.

The point here is that all businesses, in the long run, ought to upgrade to becoming compatible cloud firms. The question raised now is how far a company wants to get behind before noticing that the time has come to make a move?

An Overview of Cloud Computing

When people talk about "Cloud computing," it means the process of delivering any form of computing service via the web. It protects servers; it brings about security and accesses various types of computer and online data, networking, databases, storage, software, analytics, to mention but a few. All that any company requires is to take part in an internet connection. Perhaps, you already have that covered. It stipulates that all the files stored and the systems you are running through clunky servers can be moved to a platform that can be retrieved around the clock at any location. Entering the cloud is like eradicating any obstacles holding you back from communicating and working from anywhere.

How does cloud computing look in the business landscape?

A cloud-based setup can be used for storing data, networking, and essential office apps. A cloud-based system can be modified to use machine learning to assist in making any decision through an organization.

What Can You Do With Cloud Computing?

There's no doubt that you can do amazing things with cloud computing. Several parts of business processes can be handled with cloud-based technology. For

example, designers can make new applications and services on whichever platform with resources that ensure that all agreement requirements are being met. Cloud-based computing also provides stress-free testing and building of applications for your organization.

Many companies are delighted at the considerable cost and time reduction required for app development as soon as they upgrade to the cloud. It's also promising to protect data using the cloud while transferring. Users can effortlessly share data from wherever location or any device knowing that everything is safe. The excellent connectivity doesn't end there. With the cloud, users can access and stream video or audio from wherever they like at any time they want. Some sets of users can as well access the same content at the same time. Think about what the cloud can do to improve the effectiveness of your meetings.

Do not disregard ways in which cloud-based infrastructure could make it very easy to analyze data. This is more evident if you're trying to get a complete picture of your data across different offices, divisions, or teams.

Cloud-based computing helps you bring data together and use all the data you've gathered to make smart business choices based on your understanding. It will all be visible in front of you.

Your business would fail and fall in your presence if you're still not convinced about tapping into the systematic power of today's technology.

Benefits of Cloud Computing

Below is vital importance for using Cloud computing in your company:

1. Cost Savings

Cost-saving is the main advantage of cloud computing. It enables you to save a significant capital cost as it doesn't require any physical hardware investments. Additionally, it doesn't require any skilled personnel to maintain the hardware. The cloud service provider does both acquiring and managing the tool.

2. Strategic edge

It gives you a competitive advantage over your competitors. It creates an avenue to access the most recent apps without spending money or time on installations.

3. High Speed

Cloud computing enables you to organize your service faster with limited clicks. This faster arrangement gives you access to needed resources for your system in fewer minutes.

4. Back-up and restore data

As soon as the data is saved in the cloud, it is faster to acquire back-up and retrieval, a time-consuming process on-premise.

5. Automatic Software Integration

In the cloud, software incorporation is something that happens automatically. Thus, you don't require extra effort to customize and integrate your apps regarding your preferences.

6. Reliability

Reliability is among the highest advantages of cloud computing. Updates can always be gotten instantly about changes.

7. Mobility

Employees working in the background or at a secluded location can effortlessly access all cloud services. All they require is web connectivity.

8. Unlimited storage capacity

It gives a nearly unlimited capacity of storage. At whichever time, your capacity of storage can be expanded as fast as possible with very minimal monthly charges.

9. Collaboration

Cloud computing's platform enables employees located in various geographical areas to corporate in an incredibly convenient and safe manner.

10. Quick Deployment

Last but not least, cloud computing offers you an advantage for fast development. Therefore, if you choose to use the Cloud, your total system can be entirely efficient in minimal minutes. Even if the amount of time used depends on the type of technologies used in your firm.

Features of Cloud Computing

Below are the characteristics of Cloud Computing:

1. Resources Pooling

It stipulates that the Cloud provider drawn to the computing resources creates services to numerous customers with a multi-tenant model. There are various virtual and physical resources allocated and reallocated depending on the customer's demand. Usually, the customer has no regulation or data of the location of the resources provided but can stipulate location at an advanced level of abstraction.

2. On-Demand Self-Service

It's among the vital and valued characteristics of Cloud Computing as the user can endlessly observe the capabilities, server uptime, and selected storage network. With these characteristics, the user can as well follow computing abilities.

3. Easy Maintenance

Regularly, the servers are maintained, and the loss time is minimal, and even in some instances, there is no loss time. Cloud Computing originates all the time by continually enhancing it. The updates are mostly well-suited with the devices and speedily perform than previous ones with fixed bugs.

4. Large Network Access

Users can access the Cloud data or upload the data to the Cloud from wherever you are with the aid of a device and a web connection. Such abilities are accessible all through the network and obtainable with the assistance of the internet.

5. Availability

The capabilities of the Cloud can be adjusted as its use can be significantly prolonged. It scrutinizes the storage usage and allows the user to get extra Cloud storage as needed for a low cost.

6. Automatic System

Cloud computing spontaneously analyzes data required and aids a metering ability at a particular stage of services. Usage can be controlled, reported, and monitored. It offers transparency for the host and the customers.

7. Economical

It is a one-time asset as the organization (host) is to purchase the storage with a small portion of it to be made available to various companies that save the host from monthly or yearly costs. Just the amount spent is on the necessary maintenance and a reduced expense that is significantly less.

8. Security

One of the significant characteristics of cloud computing is "Cloud Security." It makes a snapshot of the saved data so as the data wouldn't get missing even though one of the servers is damaged. The data is inside the storage devices that cannot be hacked or exploited by someone else. The storage service is fast and dependable.

9. Pay as you go

With cloud computing, users have to pay for services or space utilized. There isn't any additional charge or hidden charge that is to be paid. It then means that the Service is cost-effective, and usually, some space is given for free.

10. Measured Service

Cloud Computing resources are used in monitoring, and the company can use them for recording. The resource deployment is analyzed through supporting charges-per-use abilities. It signifies that the useful resources that can either be virtual server cases running in the Cloud are being observed and reported by the service provider. The pattern pay as you go varies according to the actual

consumption of the manufacturing organization.

CHAPTER FOUR

WHERE (AND HOW) TO START LEARNING AWS AS A BEGINNER IN AWS

Amazon Web Services is so excellent. When you're new to Amazon Web Services, you'll understand the sense of being lost and not knowing where to

begin. But now, there's going to be a change. All doubts would be cleared, and everything you need to know would be discussed to start the AWS learning process.

After reading this book, you'll know about the core services of AWS and also understand how learning can be structured on the core services and how to begin AWS with practical experimentation.

WHERE TO START LEARNING AWS?

The three parts that you should focus on when beginning AWS are:

TIP 1: LEARN CORE AWS SERVICES FIRST

In Amazon Web Services, many services are made on or about a set of core services. But what is meant by "core services"? And why is it conceivable for services to be made on another? The better way to know how services are made on each other is to take an instance; therefore, let's do that.

Actually, very quickly, before introducing this instance, let's stress on a vital point: try not to get caught up with the essentials, such as the service abbreviations or the way they work. One can easily get lost in such details.

There's a service by AWS referred to as Elastic Container Service (ECS). It permits you to run a container-based service. If you run services on ECS, you can align the host for your containers to run on. And an option is in running your host on Elastic Cloud Compute (EC2). In such a situation, EC2 is an essential service. And when you're not well informed about EC2, it'll lead to difficulty working with EC2.

This is what it means; as soon as you learn particular services networking with it, other services become stress-free.

A lot of services in AWS are just some sort of surface services complementing and building on others.

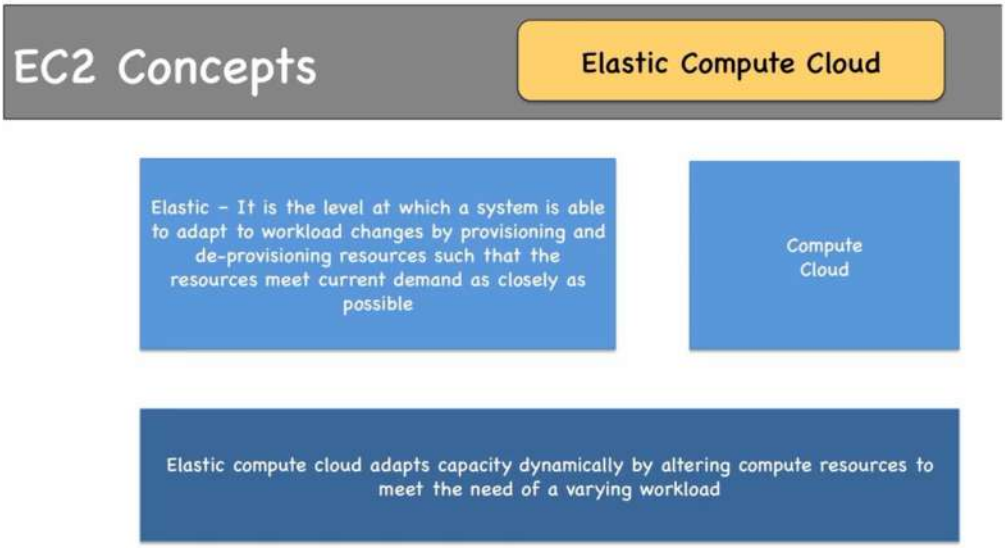
That is the reason when it comes to acquiring knowledge on AWS; it's essential to study the core services at first. If so much effort is spent on learning the services' surface, you'll find it difficult to see how the parts fit together, and there'll be a prolonged and more wasted time acquiring AWS.

WHAT IS EC2?

EC2 is the leading AWS product; it can be found where maximum AWS revenue originates. This brings to mind, why is EC2 so prevalent?

Let's begin with the name: EC2 is an acronym for Elastic Compute Cloud that is popular due to its flexibility. Various kinds of workloads can be run on EC2. WordPress can be installed in running a website. The database can be installed, or data can be stored, all right under the EC2 machine. You can run almost

everything on EC2.
I know you may be thinking that if EC2 is that flexible, why then do we need other services and not run everything on EC2? And that's a huge question! The short answer, however, is that the different services are very focused. For example, you can run a database on EC2; nevertheless, if you do that, it'll require you to manage it personally. So AWS gives a service, RDS, that removes some of the difficulty of preserving your database. But guess what? AWS runs it beneath the hood on EC2.
EC2 is very much of a core service, which is worth your time to know the shade of the way it works. However, we don't just run machines in the cloud, and in AWS, we require other characteristics such as authorizations. And that's exactly where IAM comes to play…



WHAT IS IAM?

AWS IAM is the way you manage authorizations and accessibility in AWS. To launch your EC2 case from the previous one, you require having a user having the right access to do so. And to get such access, you need to use AWS IAM.
Though sometimes, IAM can appear complicated or deceptive. IAM is not just how users can access things in AWS; it's also how you allow machines to interact with each other. For example, if we look at EC2 once more, an EC2 machine can be responsible. And such responsibility governing what the EC2 can or cannot do. I hope you now understand what IAM means when it comes to core service?
Therefore, let's say that we start talking about IAM; what would you hope to learn? The answer then is: learning the various IAM relationships and objects. Between IAM, there're roles and policies, groups, users that are somehow

related. Let's see an illustration.
A particular user can be in one group, and such a group can access policies that are granted to such users. Though, a user can as well have direct policies. Both approaches have advantages and disadvantages. For example, they are directly ascribing a policy to a user that has to be updated for many users if you want to grant them similar permissions. Understanding these nuances is crucial to setting your head about IAM.
Again, I hope you can start to see why IAM is a core service and why it should be worth your time to learn. But with EC2 and IAM in the bag, let’s move on now to the third core service, and that’s S3. But what is S3?

WHAT IS S3?

Using AWS for zip files

S3 is an alternatively flexible service that is deceptive that enables you to save files in a flexible manager. S3 could be in hosting websites, keep assets like images, including logging files for your app. If you ever require simple resolution for files, possibly, S3 can be the answer.
Why S3 is a core service is as a result of its adaptability nature. Recall that we emphasized services being made on another or around others; few instances would be given now where S3 is the foundation for other AWS services.
For example, if you intend to use AWS Redshift (that is, a querying instrument), you’ll have to place your data in an S3. Wish to gain access logs for the AWS account? The data will be in S3. Require a backup of your RDS database? S3 once more. Need for hosting a fixed website? S3 again. Need for turning on logs for a load balancer? Yep, your guess is as good as mine: use S3.
Now the point is so exact. But summarily, various services in AWS are created within S3. It then makes more sense to study S3; else, employing other AWS services will appear more challenging once you realize how important it is to comprehend how S3 works to be useful.
I guess the above discussion, as per S3, concludes this entire section about core services. Nevertheless, before we can move on, let’s briefly discuss some other services at an elevated level.

WHAT OTHER AWS SERVICES SHOULD YOU KEEP AN EYE ON?

It was challenging to choose the “core” services since it will be determined by your firm or business organization’s services used. But be rest assured that EC2, IAM, and S3 would be used at various points. Though they aren’t the only services, therefore quickly, let’s have an insight into these other services that

would be next on your hit list after the three, and they are as follows:

- **CloudWatch:** It is a built-in AWS checking tool.
- Route 53 — Domain purchasing as well as DNS routing. Enables you to assign your server or website to a domain name.
- RDS — The AWS introduced database solutions. Has a collection of databases from SQL to document-based.
- CloudFormation — AWS in-built Structure as Code. Generate resources through writing your infrastructure as a JSON template and allow AWS to form it.

For you to comprehend CloudFormation, you have to know what infrastructure is as a code,

TIP 2: GET HANDS-ON WITH AWS

Put: the paramount way of getting set up while learning AWS is by

Put: the best way to get setup and learning AWS is by having hands-on.

However, to get hands-on, you'll have to make sure everything in your AWS account is appropriately set up. Many users have made similar mistakes on their first time, typically leading them to get a huge bill or having their accounts hacked as a result of the fact that they had no idea about the little preventive measure they could have taken to safeguard their account.

We've succeeded in elaborately analyzing AWS account setup previously; if you wish to go through the devoted article to AWS account setup, you'll discover it here: Your individual AWS setup (including how to avoid being hacked). But then, before going into the details, let's get a highlight of what we are going to deliberate on:

- The root account and why you aren't supposed to use them.
- Access keys and the reason you've to be mindful of where they are saved.
- MFA and how it safeguards your account from being hacked.
- Infrastructure as a Code, and exactly how it enables your faster hands-on learning.

Does this sound good? All right, let's go on …

CHAPTER FIVE

THE ROOT ACCOUNT

AWS Root Login

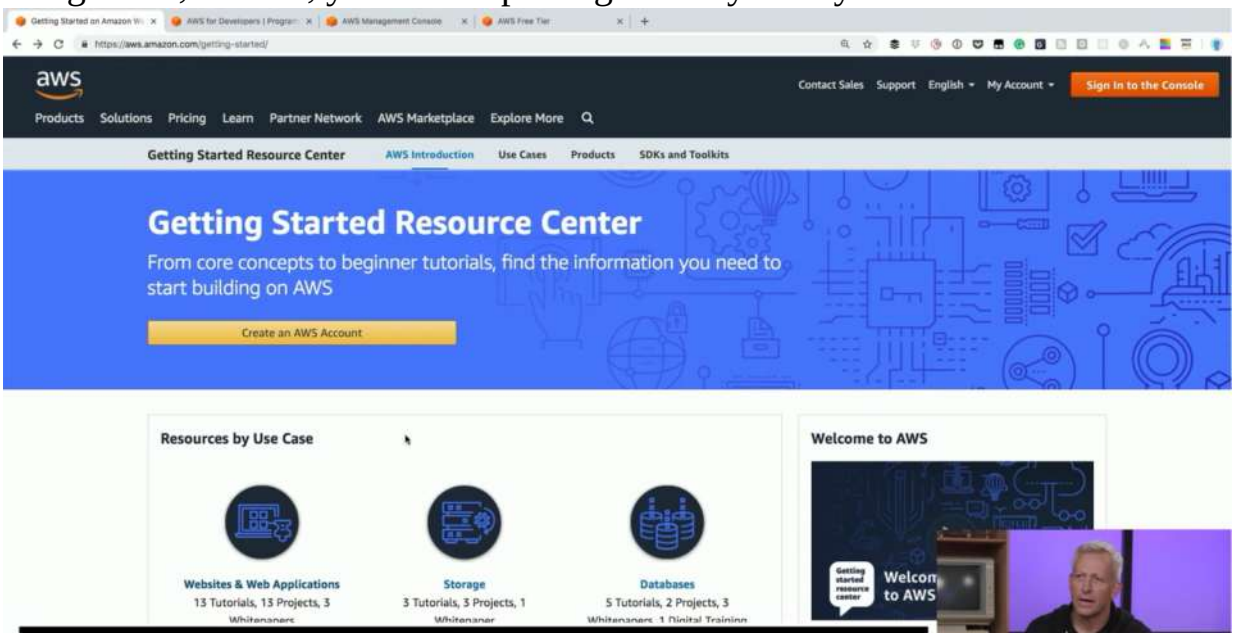
The root account is an account you sign up with to AWS. Why your root account is essential is that it has better access to everything. Therefore, if such an account is carelessly handled, the hacker can do a lot as they wish.

To stop the issue of having your root account hacked, firstly, after setting up your AWS account is to create a new user and limit its access. You can then use the newly created user account in accessing AWS and not your root account.

Getting Started

Step 1: Sign up for AWS

When you sign up for AWS, you can access Amazon's cloud computing services. Note: The sign-up procedure needs a credit card not to be charged until you begin to use the services. There's no prolonged dedication for you to continue using AWS; instead, you can stop using it at any time you want to.



Step 2: Launch an Application

For you to begin the use of AWS for internet hosting, use the point-and-click AWS Management Console to launch and manage your cloud resources.

Step 3: Get Help

Need help? Get support from AWS practical support engineers with AWS Support or find an AWS Solution Provider from the ecosystem of Systems Integrators and Independent Software Vendors (ISVs), or get your questions answered by the AWS community on the AWS Community Forum.

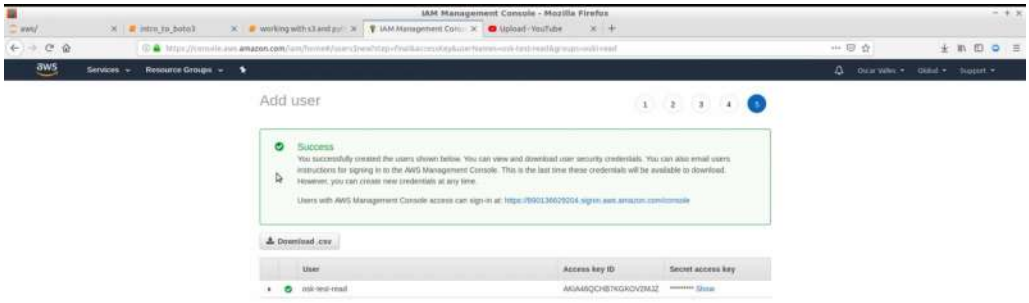
CHAPTER SIX

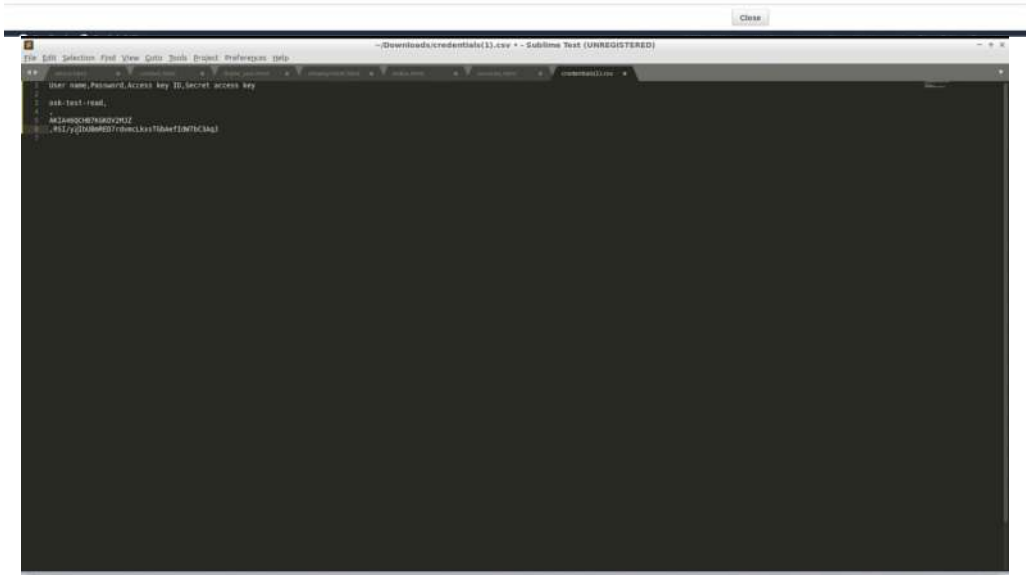
AWS CREDENTIALS AND ACCESS

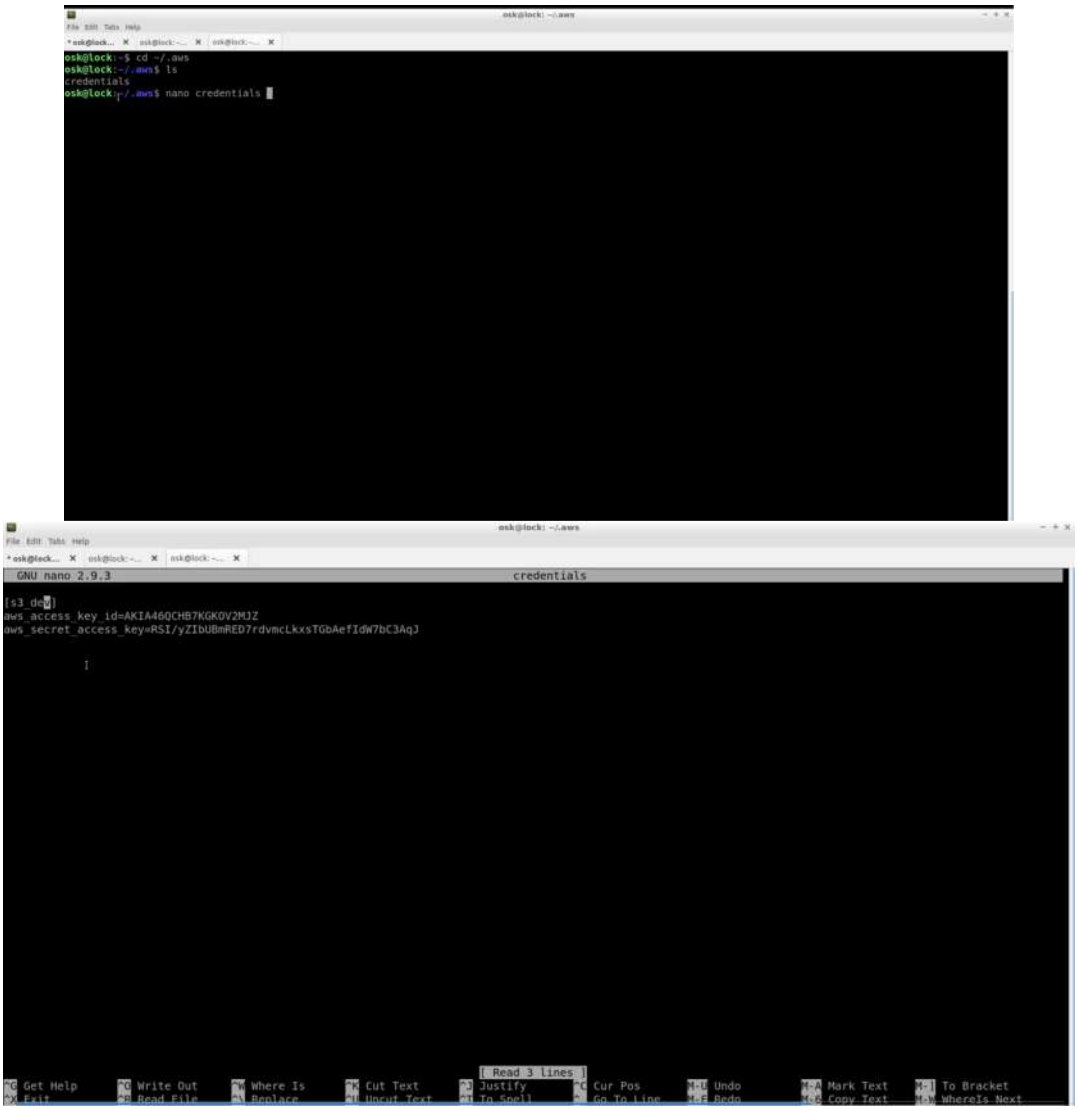
AWS Access Keys

The next area to focus on is your AWS access. There are dual key ways to relate with AWS, holistically and via the interface. You may start with poking within the AWS interface for some time. However, a time will come when you'll have to access a resource, and you'll require programmatic access.

And that's how the notion of access keys came in. An access key and secret is combining double strings which are used in granting access to AWS. Access keys enable you to read data about resources, publishing resources, etc. Since they are in charge of giving access, you should be mindful of where you put such keys.







CHAPTER SEVEN

AWS MFA

MFA is an acronym that stands for multi-factor authentication. With enabled MFA, you wouldn't access your account if you don't have another physical device you require.

Enabling MFA for your account makes sure that your hacker would at least require your smartphone or a device to access your account if your password is exposed.

To enable MFA is straightforward; it just requires limited button clicks from inside the IAM interface. Therefore, you may need to do it right away as you're setting up your account.

LEARN INFRASTRUCTURE FIRST

Terraform

Learning about AWS, the intuitive approach is to begin with tapping the interface to make resources. However, in my understanding, the poking within this kind of learning procedure can be very frustrating and quickly problematic.

But then, you may ask, why is tapping around so frustrating? And a few reasons are behind it. The UI for AWS can be challenging, which usually changes; whatever you learn today may not be there tomorrow. Besides, behind the scenes, AWS can perform magical things, such as launching many services behind you.

Therefore, if tapping around in the interface is painstaking, what then is the better choice? Learn infrastructure-as-a-code. Infrastructure as a code enables you to outline your resources as codes and save them in version control. Using Infrastructure as a code setup, changes you've affected can easily be seen, rolling back and deleting your resources. Which can be far less hectic than casually clicking within AWS?

There're dual critical choices available to you for this form of Infrastructure as a code: Terraform and CloudFormation.

Terraform is an exposed source alternative, while CloudFormation is a tool owned by AWS.

PART 3: STRUCTURE YOUR AWS LEARNING

When you do not organize your learning, the risk involved is that you can get lost in an ocean of details while you spend much time learning outside areas and disregarding the useful ones. But how can you include this structure in your learning?

Singularly, one best way to include the structure is by taking a look at the various AWS exams. At this time, I can tell what is running through your mind: I don't understand the significant thing about AWS, so why should I take the exam? Which is a good challenge, but then again, let me clarify why the exams are useful, to begin with as a logical point.

AWS has carried out a lot of research regarding their exams. As such, a suitable structure has been created so that the exams begin with fundamental skills before moving to the various specialized areas. This gives them an edge to structure your learning. Let’s move forward, so you’ll understand what I mean and look into the various exams.

UNDERSTANDING THE AWS EXAM STRUCTURE

AWS exams are divided into various groups. The associate exam is your entry-level exam, while the professional exam is built on top of the associate exam

having many details. You can also go through a specialty route while learning a particular topic such as Security or Networking.

AWS Exams

All right, viewing all the exams is good, but then, we understand that you're just beginning, so where can you start as a beginner?

The important place to begin as a total beginner is with the "Cloud Practitioner Exam." This exam would expose you to the concrete bases in AWS. Once you're done with the exam, you can now take a salient look at one of the associate examinations: Developer, SysOps, or Architect according to your preference.

Cloud Practitioner

If, for instance, a great job has been done to prove that the exam is a better place to construct your learning. Then where can you begin? One of the top sites that are currently in websites learning for these courses is ACloudGuru. It has diverse resources on where you can start. I will advise you to view their certification prep guide and go ahead and attempt the cloud practitioner course.

To be fair enough, there are further devoted services for cloud training, such as Linux and Cloud Academy, that may be suitable for your needs, so be sure to check them out as well. ACloudGuru is very straight to the point and reliable, which is why I recommend it.

Services provided by AWS

All kinds of services in this "What is AWS" blog is characterized in the domain; the small number of domains that are generally used are:

- Compute
- Storage
- Database
- Migration
- Network and Content Delivery
- Management Tools
- Security & Identity Compliance
- Messaging

The Computer Services

The Compute domain comprises of services relating to computing jobs, it consists of the following services:

- EC2 (Elastic Compute Cloud)
- Lambda
- Elastic Beanstalk

● Amazon LightSail

The Storage Services

The Storage domain comprises of services relating to data storage, it consists of services as follows:

● S3 (Simple Storage Service)
● Elastic Block Store
● Amazon Glacier
● AWS Snowball

The Database Services

The Database domain is used for database related workloads, Its services consist of the following:

● Amazon Aurora
● Amazon RDS
● Amazon DynamoDB
● Amazon Redshift

The Migration Services

The Migration domain is used in transferring data to or from the AWS Infrastructure; it includes the following services:

● AWS Database Migration Service
● AWS SnowBall

The Networking and Content Delivery Services

The Content Delivery domain and Networking are used to isolate your content delivery and network infrastructure that is used in delivering content faster. The services consist of the following:

● Amazon Route 53
● AWS CloudFront

The Management Tools

The Management Tools domain comprises of services that are used in managing further services in AWS; the benefits include the following:

● AWS CloudWatch
● AWS CloudFomation
● AWS CloudTrail

The Security & Identity, Compliance Services

The Security and Identity, including the Compliance domain, comprises services used in managing authentication and providing security to your AWS resources. Its services comprise of the following:

● AWS IAM
● AWS KMS
● AWS Shield

Messaging Services

The Messaging domain includes services that are used in emailing, notifying, and queuing messages. Its domains comprise of the following:

- Amazon SQS
- Amazon SNS
- Amazon SES
- Amazon Pinpoint

Now that you have a rational idea of what AWS is and the services rendered in AWS let's move ahead and immediately apply this information to form apps.

How to build applications in AWS?

You should start by analyzing what your application is all about? Is it something requiring you to be concerned about the underlying infrastructure? Does it require a database? Does it require constant monitoring?

Consequently, immediately you understand all the necessities about your app, you can choose the domain and select a service.

Let's assume that you intend to deploy an app in AWS that you do not need to get yourself worked up about the fundamental architecture, which Service would you select?

Anyway, in the compute section, you can find a service tagged Elastic Beanstalk. Simply upload your app, and AWS would do the rest for you. It's that easy!

Indeed, you wouldn't be aware of such services when you don't use them right. That's the reason AWS exists with an incredible free-tier option.

Who is qualified for a free tier?

All customers from the moment of registration on the AWS platform are offered the free tier option and eligible for the same till one year from the period he registers.

CHAPTER EIGHT

HOW TO SIGN UP ON AWS

Step 1: Launch into aws.amazon.com and tap on 'Create an AWS Account.'
Step 2: Tap on the option that states 'I am a new customer,' and input your email address, and at last tap on Sign In.
Step 3: The next page is to fill in all the applicable information and tap on Create Account.
Step 4: The next page is to enter your details and tap on 'Create Account.'
Step 5: Then, you'll be asked to input the details of your credit or debit card on this page; immediately you're done with that, continue by tapping on 'continue.'
Step 6: The next Stage would be verifying your phone number, input the details, and tap on 'Call me Now.'
Step 7: You will then get a call from AWS, and you'll be requested to input a pin, following by choosing your plan for AWS, but before that, tap on 'Next.'
Step 8: You will now choose a plan suitable for you; we'll use a basic plan because this account would be done for personal use.
Step 9: Congratulations! Your AWS Account has been created and ready for use! Go sign in and play!
Since you now have an AWS account at your beck and call, why don't we do some hands-on? What do you think?
Let's launch a PHP website on EC2 while backing it up with an RDS MySQL database. You may not be used to such services; it's not a big deal; allow me to clarify you:
Elastic Compute Cloud is a compute service accessible by AWS that offers resizable compute ability in the cloud.
Therefore, simply put, you can get a server with custom to compute capacity; such capacity can be amended according to your requirement. Sounds cool, doesn't it?
Furthermore, let's now discuss what RDS is all about; thus, RDS is a Relational Database type of Service that adds various databases such as MongoDB, MySQL, etc.
Therefore, RDS mainly helps you to manage these databases.

AWS Hands-On

We would create a small app on EC2 – RDS infrastructure in this "What is AWS blog." After which, you will have a PHP app on EC2 supported by a wholly managed MySQL server.

Let’s begin with organizing an EC2 illustration.
Step 1 : Launch AWS Management Console and log in.
Step 2 : Choose a region from the displayed dropdown.
Step 3 : Tap EC2 beneath the Compute section. You’ll then proceed to the EC2 dashboard.
Step 4 : Choose ‘Launch Instance’ and hereafter choose an AMI; for our illustration, we will be selecting a ‘Windows 2016 Server Instance’ that falls below the free tier.
Step 5 : Once you select your desired AMI, choose your kind of design, this is basically where you indicate the required computing power level to start; for the moment, ours is a slight app, we will suffice with the free tier.
Step 6 : Configure all required details and tap on ‘add storage.’
Step 7 : At this point, you will be arranging your storing devices; as soon as you are done, tap on ‘tag instance.’
Step 8 : Now, you will be classifying your illustration because that is how your example would be recognized.
Step 9 : At this moment, you will be configuring your safety group.
Step 10 : View all the settings, immediately it’s confirmed, launch your instance!
Step 11 : The next stage would prompt a key pair, generate one, and download in an accessible location.
Step 12 : Choose your illustration and tap on ‘Connect.’
Step 13 : As soon as you tap to connect, the following screen would be prompted. Duplicate the public IP by copying it and then tap on ‘Get Password.’
Step 14 : Choose the key-pair you’ve downloaded, and tap ‘decrypt the password.’
Step 15 :

- Duplicate the password and the public IP.
- Ensure it’s safe.
- Be accessible because it would be required in the next step.

Step 16 : Now that we have the password and the Public IP available, let’s link it to our example! Open up the isolated desktop manager. Input the public IP address and tap on ‘Connect.’
Step 17 : Input the secure password now and tap on ‘OK.’
Step 18 : At this stage, it would display Congratulations! Windows Server on EC2 at your service!

The next step to take is to create an RDS illustration

for MySQL.

Step 1 : Choose the RDS service from your AWS Management Console.
Step 2 : As we will be launching an illustration on MySQL, choose the MySQL illustration from the list of DBs.
Step 3 : As we are making this illustration for demo purposes, we will be choosing the option of 'Dev/Test' and tap on 'Next Step.'
Step 4 : The next stage is to fill in the following details:
● You can choose your preferred Db illustration here.
● You can choose if you want to enable Multi-AZ in your MySQL Db.
● You can choose how much space you wish to assign to your Db illustration; it varies from 5GB to 6TB.
● In the long run, you will have to set your username and password for your Db Illustration.
Step 5 : The next stage is to configure Advanced Settings for your DB
Here, you will have to choose the VPC; if you do not want to launch your illustration in a VPC, you can ignore the default settings and move on.
The next stage is to choose the version of the Db you intend to use; for instance, we are using MySQL 5.6
The next action is to set your backup preferences, as the retention period, etc.
After which, we will set the maintenance window, which is the time lag during which the Db instance is updated.
As soon as you're done entering all the necessary details, you will be initiating the Db instance!
Step 6 : After all is said and done, you would receive a notification tagged Congratulations! On your first RDS Instance!!
Let us now configure the RDS instance to link your EC2 server.
Step 1 : On the RDS Dashboard, choose the RDS instance.
Step 2 : The next stage is to edit the 'Security Group,' Why? This is because you need your EC2 instance to connect to the RDS Instance. That means you'll have to include the IP address of the EC2 model at this point.
Step 3 : Choose the 'Security' group, and choose the Inbound guidelines, then tap 'Edit.'
Step 4 : Choose the MySQL/Aurora while you input the Public IP address of the EC2 instance in the other field. Note: Whichever IP address you input here must be accompanied by a '/32' to change it to CIDR notation. At the end, tap 'Save.'
There you go! Your RDS instance is now ready to accept commands from your EC2 model.

Connecting the RDS Instance Now!

Step 1 : Launch the prompt command and navigate to the bin file of your MySQL.
Step 2 : The next stage is copying the endpoint from the RDS dashboard; it would then be required of you on the next stage to connect to the RDS instance. The endpoint is how your RDS can be easily identified. The endpoint is a port number '3306' that you would also require in the next phase.
Step 3 : Go back to the prompt command and input the following command, the password would then be required, input the password you used while creating your RDS instance, then you're good to go!

How to Host your website!

Step 1 : Tap' begin' and Server Manager on the EC2 instance.
Step 2 : Tap on 'Add features and roles.'
Step 3 : Click 'Next' on the significant page, while on the next page, choose the following option and tap 'Next.'
Step 4 : Choose the option of server pool and tap on 'Next.'
Step 5 : Choose the IIS web server from your list and tap 'Next.'
Step 6 : Choose .NET Frameworks stated here, and tap 'next.'
Step 7 : This stage is the page for confirmation, scrutinize what is being installed, and tap on 'Install.'
As soon as you've installed IIS, you can now see it appearing on your server manager dashboard.
Afterward, you can install Microsoft Web Platform Installer.
Step 8 : Launch IIS now, double-tap the server, and tap on the web platform installer from the Management Section.
We will be organizing an app for PHP web. Thus we require an installed PHP on this server to need a Web Platform Installer.
Step 9 : Use your search bar of WPI in searching for PHP, install the following package.
Step 10 : As soon as it's installed, you can now view your PHP manager from IIS.

Uploading your website to this EC2 server

Step 1 : First and foremost, duplicate all your website files by copying them to this folder in "C:/inetpub/wwwroot" on the server.
Step 2 : Go back to IIS, tap on the server, and right-click 'Sites.'
Step 3 : On the name of the site, give an appropriate name to the website, and at

the next stage, give the subsequent physical path, and at the end, tap 'OK.'
Wow! Your website is now created and can be viewed live!
Step 4 : Input the public IP address of the EC2 instance, and there you are! Your website is up and running. Input the particulars and click on 'Add.'
Step 5 : It reveals that the RDS connection with the EC2 instance is functioning well. Therefore, whatever you input here is getting saved on your RDS instance, your website is also protected on your EC2 instance. Tap on 'Go Back.'
Step 6 : On the critical page, tap on 'View Results.' And this page would display. They are the records that are existing in your MySQL table.
There you go, guys! I guess you enjoyed this section. If you just read this, Congratulations! You are no longer a novice in AWS! Keep practicing because practice makes perfect in learning.

CONCLUSION

Currently, in the marketplace where there's a rise in on-demand services, AWS has developed a workable solution for business organizations that are searching for inexpensive, reliable, and scalable cloud computing services.
With separate functions in 22 geographical regions, Amazon Web Services enables firms to manage different services as well as development, data processing, game development, warehousing, and lots more.
A distinguished benefit of AWS is that your business can have access to EC2, which in turn offers a virtual cluster of computers via the internet. Hence the job of hardware resources is copied by these much-helpful server farms located across the globe.
Irrespective of the fact that you're just starting or already an already established enterprise, AWS is the best solution that can provide extensive maximum uptime, cost savings, and continuous support, which is a good return on investment, undeniably.

ABOUT THE AUTHOR

Steve M. Burnett is an Enterprise Strategist at Amazon Web Services born in New Orleans in America. He specializes in troubleshooting and diagnosing basic software issues.

He has experience in mentorship and building teams. He is a lover of good books and happily married with three kids. He is passionate about what he does and he has an M.Sc in Computer Science from Yale.

He has an indebt understanding about software applications and has an insight on Amazon Web Services.