CourseCube
(Formerly Java Learning Center)

AWS

Solution Architect

Study Guide

Module 1

AWS Fundamentals

Java Learning Center

Author
Srinivas Dande

Module 1: AWS Fundamentals

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2. Exploring Cloud Computing
3. Cloud Computing Service Models
4. Cloud Computing Deployment Models
5. Introduction to AWS
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9. Service Comparision - AWS, Azure, GCP
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Exam #1 on AWS Fundamentals

1. OnPremise Data Centers

Q) What are required to SetUp Data Center in my Premises?

- Organization which is trying to setup the Data Center at their Premises is responsible for the following
  - ✓ Data Center Physical Space
  - ✓ Racks, Power Supply, Cooling System, Internet
  - ✓ Networking
  - ✓ Storage
  - ✓ Servers
  - ✓ Operating Systems and its Licenses
  - ✓ Development Tools and its Licenses
  - ✓ Team of People to Manage the Data Center
- **Problems**
  - ✓ Requires Capital Investment for hardware and infrastructure
  - ✓ Scaling Up and Scaling Down is Complex , Time Consuming
  - ✓ Requires Dedicated Tech Support for Managing Data Center.

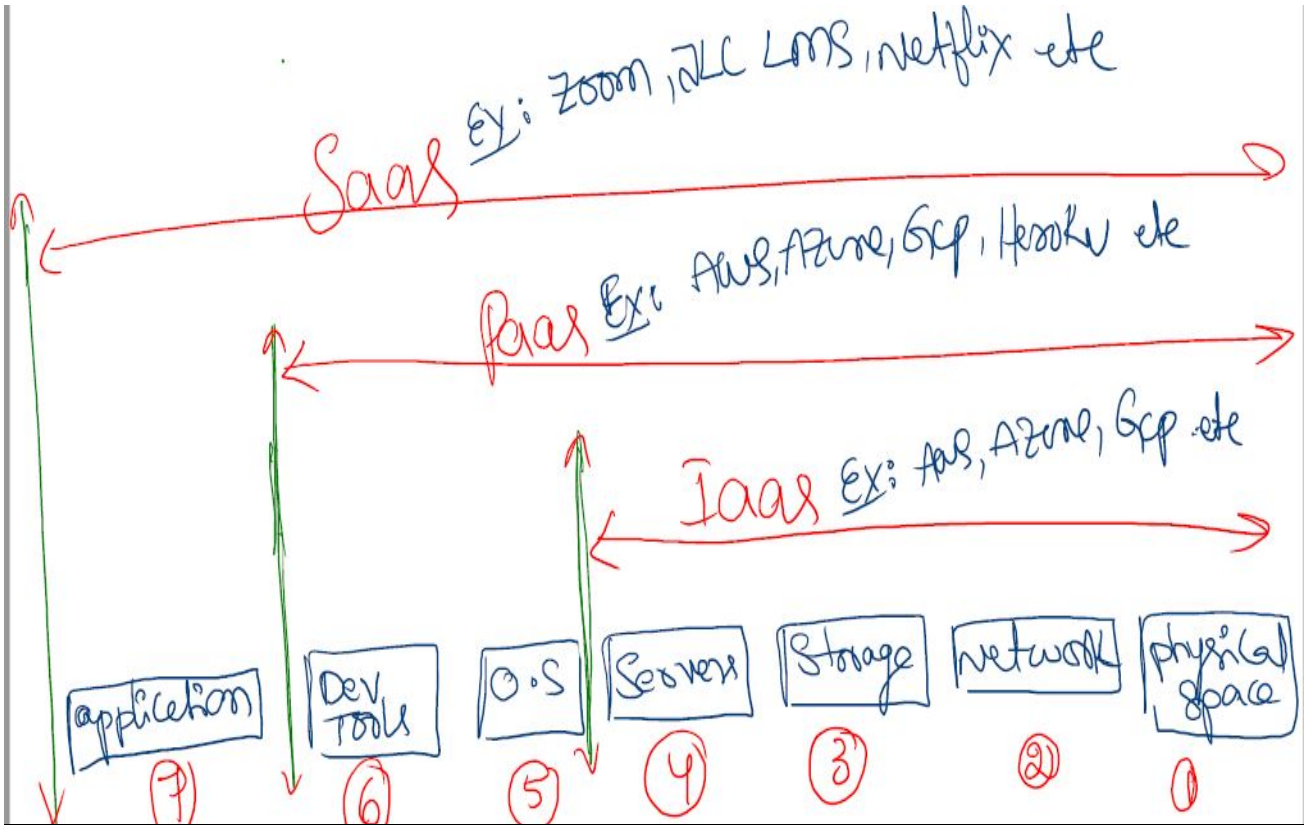
2. Exploring Cloud Computing

- **Cloud Computing** is the delivery of computing services—including servers, storage, databases, networking —over the Internet ("the cloud")
- You typically pay only for Cloud Services you use, helping lower your operating costs, run your infrastructure more efficiently and scale as your business needs change.
- Top Benefits of Cloud Computing

Cost	**Global scale**	**Performance**
Security	**Speed to Market**	**Reliability**

3. Cloud Computing Service Models

- There are 3 Cloud Computing Service Models
  - A) Infrastructure as a Service (IaaS)
  - B) Platform as a Service (PaaS)
  - C) Software as a Service (SaaS)



A) Infrastructure as a Service (IaaS)

- With IaaS, You rent IT infrastructure—Servers and Virtual Machines (VMs), Storage, Networks, Operating Systems—from a cloud provider on a pay-as-you-go basis.

  Ex:

  AWS ,Azure , GCP etc

B) Platform as a Service (PaaS)

- PaaS refers to cloud computing services that supply an on-demand environment for developing, testing, delivering and managing software applications.
- PaaS is designed to make it easier for developers to quickly create web or mobile apps, without worrying about setting up or managing the underlying infrastructure of servers, storage, network and databases needed for development.

Ex:

AWS ,Azure , GCP, Heroku, force.com etc

C) Software as a Service (SaaS)

- SaaS is a method for delivering software applications over the Internet, on demand and typically on a subscription basis.
- With SaaS, cloud providers host and manage the software application and underlying infrastructure and handle any maintenance, like software upgrades and security patching.
- Users connect to the application over the Internet, usually with a web browser on their phone, tablet or PC.

Ex:

JLC LMS , Zoom , Survey Monkey, mailChimp etc

4. Cloud Computing Deployment Models

- Not all clouds are the same and not one type of cloud computing is right for all.
- Several models have evolved to offer the right solution for your needs.
- Most Popular Cloud Computing Models are

A) Public Cloud

B) Private Cloud

C) Hybrid Cloud

A) Public Cloud

- Public clouds are owned and operated by a third-party cloud service providers, which deliver their computing resources like Servers ,Storage and Databases etc over the Internet.

  Ex: AWS , Azure , GCP , Alibaba , IBM , Oracle

- 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.

B) Private Cloud

- Private Cloud refers to cloud computing resources used exclusively by a single business or organisation.
- Private Cloud can be physically located on the company's on-Premise Data Centers. or on third-party Data Centers.
- In Private Cloud, the services and infrastructure are always maintained on a private network and the hardware and software are dedicated solely to One organisation.

  Ex: AWS , Azure , HPE , VMware , Oracle , IBM / Red Hat OpenShift , Dell, Cisco

C) Hybrid Cloud

- Hybrid clouds combine public and private clouds, bound together by technology that allows data and applications to be shared between them.
- By allowing data and applications to move between private and public clouds, a hybrid cloud gives your business greater flexibility, more deployment options and helps optimise your existing infrastructure, security and compliance.

5. Introduction to AWS

- **History**
  - ✓ In 2002 – AWS Launched Internally
  - ✓ In 2006 - AWS Launched Publicly - AWS began offering IT infrastructure services to businesses
- **AWS is the No.1 Cloud Provider Now.**
  - ✓ AWS has 47% of Market share in 2019.(No.1)
  - ✓ Azure has 22% of Market share in 2019. (No.2)
  - ✓ GCP has 18% of Market share in 2019. (No.3)
- **AWS offers build and deploy applications with**
  - ✓ High-Performence
  - ✓ High-Availability
  - ✓ Low-Latency
  - ✓ Highly-Scalable
  - ✓ Highly-Secured
  - ✓ Cost-Efective

6. AWS Global Infrastructure

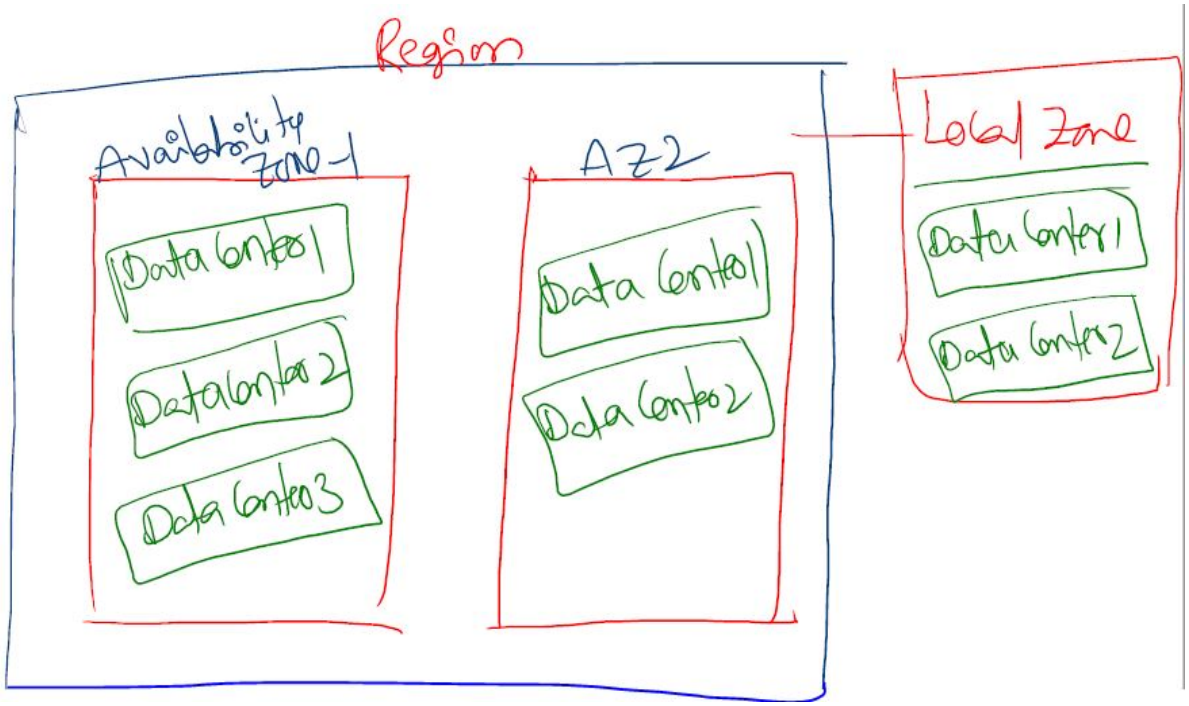
AWS Global Infrastructure

- ✓ Data Centers
- ✓ AWS Regions
- ✓ Availability Zones
- ✓ AWS Local Zones
- ✓ AWS Edge Locations

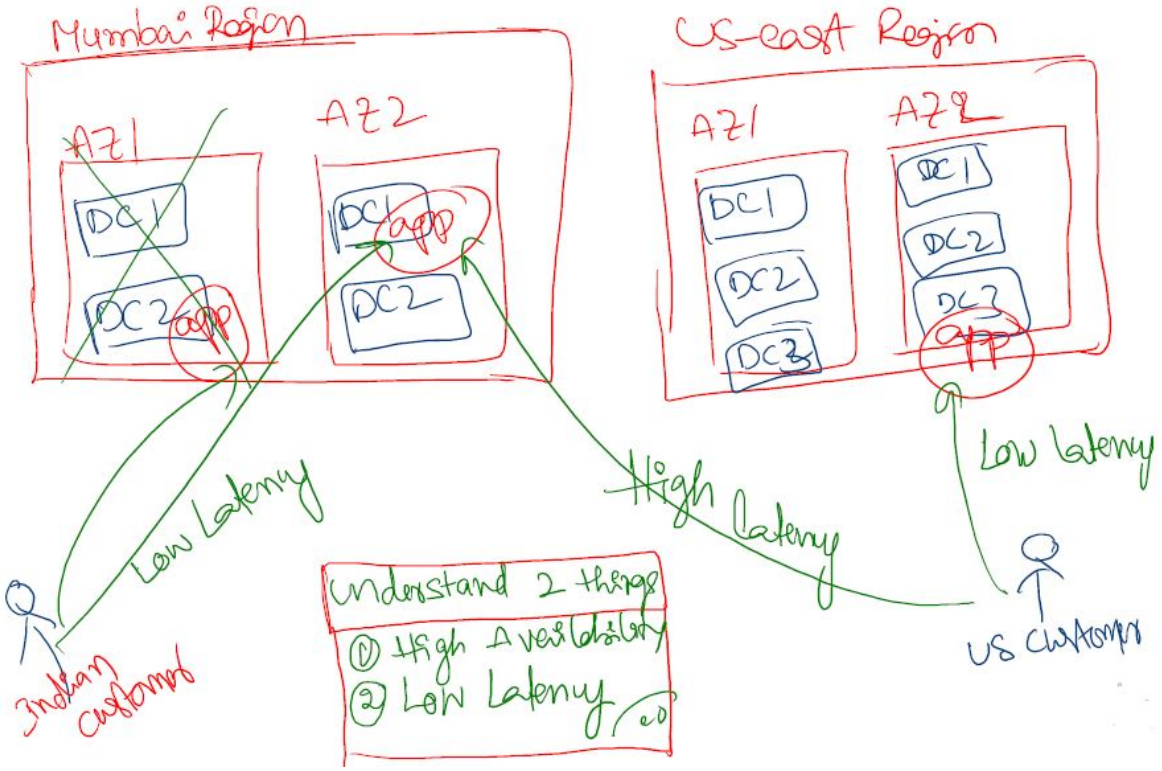
7. AWS Regions and Availability Zones

- AWS provides a more extensive global footprint to support its global footprint and ensure customers are served across the world
- **Data Center:**
  - ✓ Data Center is just a building filled with Servers with Redundant Power , Networking , Connectivity etc
- **Availability Zones:**
  - ✓ An Availability Zone (AZ) is one or more discrete data centers with redundant power, networking,
  - ✓ Group of 1 or more Data Centers called as Availability Zone.
  - ✓ 84 Availability Zones.
- **Local Zones:**
  - ✓ Local Zone is an extension of AWS Region where you can run your Latency Sensitive Applications.
  - ✓ 17 Local Zones

- **Regions:**
  - ✓ Region is a physical location around the world where data centers present.
  - ✓ Region Consists of 2 or more Availability Zones
  - ✓ Each AWS Region consists of multiple, isolated, and physically separate Availability Zones within a geographic area.
  - ✓ 26 Launched Regions
  - ✓ 8 Announced Regions
- **Edge Locations/POP Location:**
  - ✓ Edge Locations are endpoints for AWS that are used for caching content.
  - ✓ This Includes CloudFront and Amazon CDN
  - ✓ 410+ Edge Locations



8. High Availability and Low Latency



- **High Availability:**
  - ✓ **Application is Highly Available means That Application can be accessed all the time.**
  - ✓ When Deploy the Application accross Mutiple Availability Zone then You can consider that application is Highly Available because When any one Availability Zone is crashed , Customers can be access from other Availability Zone.
- **Low Latency:**
  - ✓ **Application has Low Latency means That Application can be accessed very fastly.**
  - ✓ When Deploy the Application accross Mutiple Regions (Near to Customers) then You can consider that application is accessable very fastly with Low latency.

9. Service Comparision - AWS , Azure,GCP

Service Name	AWS	Azure	GCP
Storage	S3	Blob Storage	Storage
Servers	EC2 Instances	Virtual Machines	Compute Engines
Containers	EKS	AKS	GKE
Deployments	ElasticBeanstalk	Azure App Service	App Engine
NO-SQL Databases	DynamoDB	CosmosDB	CloudDataStore
SQL Databases	RDS	SQLDatabase	BigQuery
Serverless Computing	Lambda	Azure Functions	Cloud Functions
Caching	ElasicCache	RedisCache	CloudCDN
DNS Services	Route53	TrafficManager	CloudDNS
Load Balancing	Elastic Load Balancer	Azure Load Balancer	Cloud Load Balancer

10. Creating AWS ROOT Account

1) Open aws.amazon.com
2) Click ON **Create an AWS Account**
3) Step 1 of 5 will be displayed.

Step 1 of 5: Provide the Following

Email : _____

Password: _____

Confirm Password: _____

AWS Account Name: _____

After Providing above, Click on **Continue (Step 1 of 5)** Button

Note : It may show Security Question, Answer the Security Question

4) Step 2 of 5 will be displayed.

Step 2 of 5: Provide Personal Information

Account Type: Personal or Business – Choose Personal

Full Name : _____

Phone Number: _____

Country : _____

Address 1 : _____

Address 2 : _____

City : _____

State : _____

Postal Code : _____

Check the Terms and Conditions Check Box

After Providing above, Click on **Continue (Step 2 of 5)** Button

5) Step 3 of 5 will be displayed.

Step 3 of 5: Provide Billing Information

Credit or Debit Card : _____

Expiry Date : _____ _____

Card Holder Name : _____

CVV : _____

Billing Address :

Use My Contact Address **(Check this)**

Use New Address

Do You have PAN Card:

Yes **(Check this)**

No

PAN Card : _____

After Providing above, Click on **Verify and Continue (Step 3 of 5)** Button

Note: Now It redirects to Your bank Gateway and **Your bank Gateway Ask for OTP**
After OTP Verification , It ReDirects to AWS

6) Step 4 of 5 will be displayed.

Step 4 of 5: Confirm Your Identity

Verification Code:

Text Message (SMS) **(Check this)**

Voice Call

Country Code : _____

Mobile Number : _____

Secuirty Check : _____

After Providing above, Click on **Continue (Step 4 of 5)** Button

Note: Now You will get SMS with Verification Code.

Verification Code : _____

Enter the Verification Code and Click on **Continue (Step 4 of 5)** Button

7) Step 5 of 5 will be displayed.

Step 5 of 5: Select the Support Plan Required.

By Default, It selects Basic Support – Free - Keep it as it is
And Click on **Completed Signup** Button

8) Congratulations Screen will be displayed.

Now Click on GoTo AWS Management Console

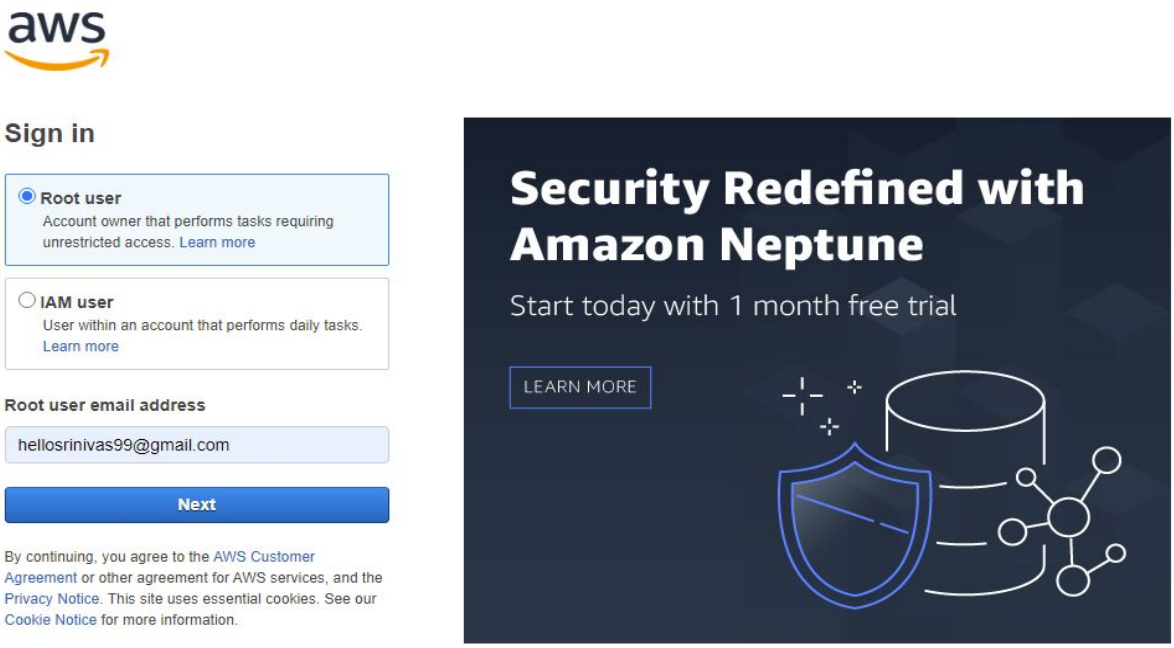
Now It shows the SignIn form

- Select the ROOT User
- Provide email Id and Password
- Asnwer the Securiry Question

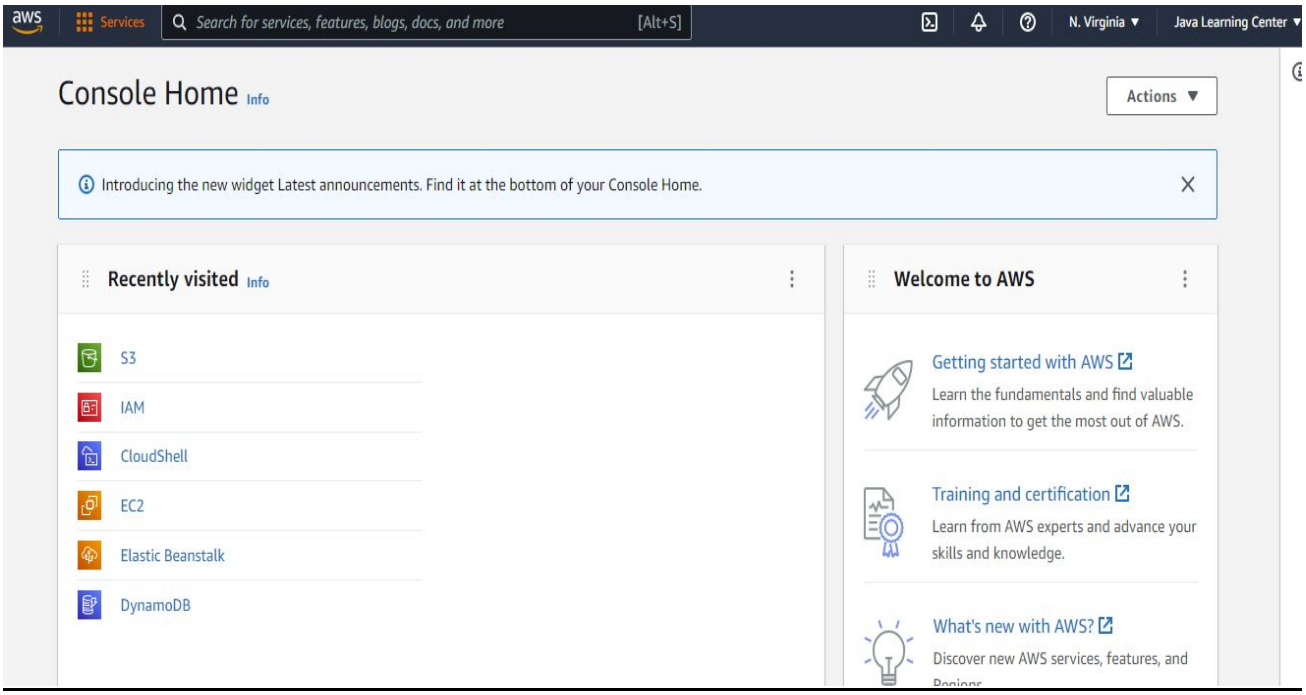
Finally You will see AWS Management Console

11. Accessing AWS from Console

- Login to Console as Root User with - Username and Password



- You can see Console Home with all the AWS Services to start working as below.



12. Accessing AWS from CLI

- To Access AWS Resources from CLI or SDK, you need two Access Keys

  1) Access Key ID
  2) Secrect Access Key

- Till Now, we have only User called Root User.
- You can generate the Access Keys required for ROOT User to access AWS Resources from AWS CLI or AWS SDK but It is nor Recommandeble to Use Root User Access Keys.
- SO Create One User and Use that User related Access Keys

A) <u>Steps to Create IAM User:</u>

1) Logon to AWS Console with AWS Root Account.
2) Create the IAM User with the name - hello123
3) When you create User in AWS, You can give two types of Acesss.

   A) Access to Management Console

   B) Progrmatic Access

4) When User is Created , AWS assigns least permissions to that user.

5) You can assign the required permissions to that user.

6) When user wants to access the AWS with Management Console then user needs Username and Passoword.

7) When user wants to access the AWS Progrmatically with Commandline or any other tools then user needs Access key ID and Secret access key

8) Download and Keep the following Information belongs to the User

   a) User name : hello123

   b) Password : hello@123

   c) Access key ID : AKIASNQ765N6SRPYEAATN

   d) Secret access key : zViUOer9AAYzufFk9rntcl2h1oJdQcBtl8+NZq

   e) Console login link : https://166473396133.signin.aws.amazon.com/console

B) <u>Download and Install AWS CLI:</u>

1) Download AWS CLI

   https://docs.aws.amazon.com/cli/latest/userguide/getting-started-install.html

   https://awscli.amazonaws.com/AWSCLIV2.msi

2) Install AWS CLI

   Location to Install : E:\Amazon\AWSCLIV2

3) Configure the AWS CLI

aws configure

AWS Access Key ID [None]: **AKIASNQUWN6SRPYEAATN**

AWS Secret Access Key [None]: **zViUOer9AAYzTBufFk9rntcl2h1oJdQcBq**

Default region name [None]: **us-east-1**

Default output format [None]: **json**

C) <u>Now Run AWS Commands from CLI:</u>

- Create IAM User

  aws iam create-user --user-name hai12345

- List IAM Users

  aws iam list-users

- List S3 Buckets

  aws s3 ls

- List Regions

  aws ec2 describe-regions

- List the Zones of region **ap-south-1**

  aws ec2 describe-availability-zones --region ap-south-1

13. AWS CloudShell

- AWS CloudShell is a browser-based shell that makes it easy to securely manage and interact with your AWS resources.
- CloudShell is pre-authenticated with your console credentials. Common development and operations tools are pre-installed, so no local installation or configuration is required.
- With CloudShell, you can quickly run scripts with the AWS Command Line Interface (AWS CLI)
- You can use CloudShell right from your browser and at no additional cost.
- AWS CloudShell is available only in Limited Regions. Check your region.
- Click the CloudShell Icon to Launch the CloudShell as shown below.

14. Shared Reesponsibility Model

- Not all the things done by AWS.

AWS - Responsibility for Security OF the Cloud

- ✓ Hardware , Regions , Availabilit Zones , Edge Locations
- ✓ Compute , Storage , DataBases , NetWorking

YOU - Responsibility for Security IN the Cloud

- ✓ Customer Data
- ✓ Platforms, Applications, IAM
- ✓ OS Patches, Updates
- ✓ Client Side Encryption
- ✓ Server Side Encryption

15. Key AWS Services

- 25 Service Types are provided by AWS on 4th-June-2022.
- Following Top Key Service Types.

A) Compute

- ✓ EC2, Lambda, ElasticBeanstalk

B) Storage

- ✓ S3, EBS, EFS, Fsx, Storage Gateways

C) Databases

- ✓ RDS, DynamoDB, RedShift

D) Networking

- ✓ VPC, Route 53, Direct Connect, API Gateways

16. Exam Tips

1) Building Blocks of AWS

- ✓ AWS Global Infrastructure
- ✓ Regions
- ✓ Availability Zones
- ✓ Local Zones
- ✓ Data Centers
- ✓ Edge Locations

- **AWS Global Infrastructure**
  - ✓ 26 Regions and 8 Regions Announced
  - ✓ 84 Availability Zones and 17 Local Zones
  - ✓ 410 + Edge Locations/POP locations
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- **High Availability:**
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3) Shared Responsibility Model

- ✓ What You have to do
- ✓ What AWS will do

4) Key AWS Services

A) Compute

- ✓ EC2, Lambda, ElasticBeanstalk

B) Storage

- ✓ S3, EBS, EFS, Fsx, Storage Gateways

C) Databases

- ✓ RDS, DynamoDB, RedShift

D) Networking

- ✓ VPC, Route 53, Direct Connect, API Gateways

Exam #1 : AWS Fundamentals

Q1) What category would the VPC service fall into?

A) Machine Learning
B) Compute
C) Database
D) Networking

Q2) Which statement best describes an Availability Zone?

A) A physical data center that is connected to AWS cloud services.
B) A single data center that makes up an Edge location.
C) One or more discrete data centers with redundant power, networking, and connectivity in an AWS Region.
D) A collection of EC2 instances that is guaranteed not to fail.

Q3) Which category would the EC2 service fall under?

A) Compute
B) Networking
C) Database
D) Machine Learning

Q4) Which statement best describes an Edge location?

A) A physical location somewhere in the world where data is stored.
B) A virtual type of compute instance that is located all over the world to deliver your content to your customers in a speedy fashion.
C) A virtual location that can be used to handle authentication and authorization of your users in the cloud.
D) A networking point of presence that is one of many spread across the globe that is commonly used to cache content.

Q5) Which one of the following items are NOT managed by AWS according to the shared responsibility model?

A) Preventing power outages
B) Customer data
C) Security of the data center
D) Physical networking infrastructure

Q6) According to the Shared Responsibility Model, who is responsible for patching, updating, and maintaining the OS of EC2 instances in AWS?

A) Srinivas Dande
B) You
C) AWS
D) No one (EC2 instances never need to be updated)

Q7) Which of the following is NOT an AWS storage service?

A) Storage Gateway
B) EBS
C) EC2
D) S3

Q8) Which statement best describes a Region?

A) A virtual location around the world where you can create Availability Zones.
B) The original location of your data center that you're going to migrate into AWS.
C) A networking point of presence in a country.
D) A physical location around the world comprised of two or more Availability Zones.

Exam #1 : Answers

Q1	D
Q2	C
Q3	A
Q4	D
Q5	B
Q6	B
Q7	C
Q8	D