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Introduction to Cloud Computing

INTRODUCTION

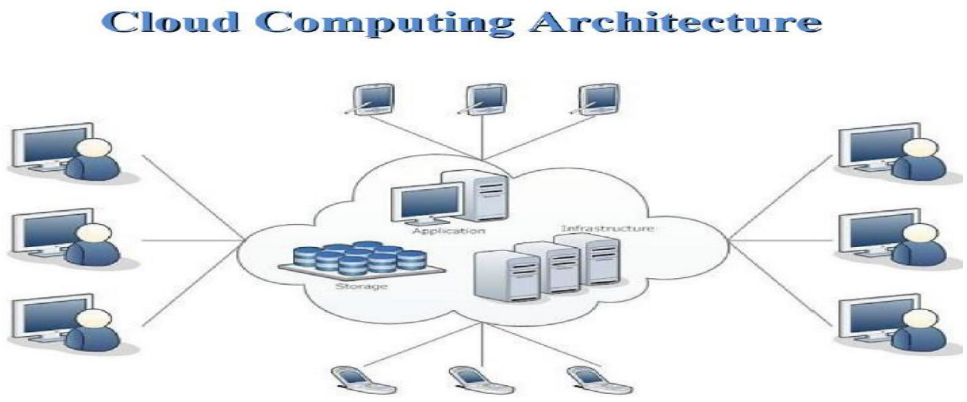
Cloud Computing provides us a means by which we can access the applications as utilities, over the Internet. It allows us to create, configure, and customize applications online. With Cloud Computing users can access database resources via the internet from anywhere for as long as they need without worrying about any maintenance or management of actual resources.

What is Cloud?

The term Cloud refers to a Network or Internet. In other words, we can say that Cloud is something, which is present at remote location. Cloud can provide services over network, i.e., on public networks or on private networks, i.e., WAN, LAN or VPN. Applications such as e-mail, web conferencing, customer relationship management (CRM), all run in cloud.

What is Cloud Computing?

Cloud Computing refers to manipulating, configuring, and accessing the applications online. It offers online data storage, infrastructure and application. Cloud Computing is both a combination of software and hardware based computing resources delivered as a network service.



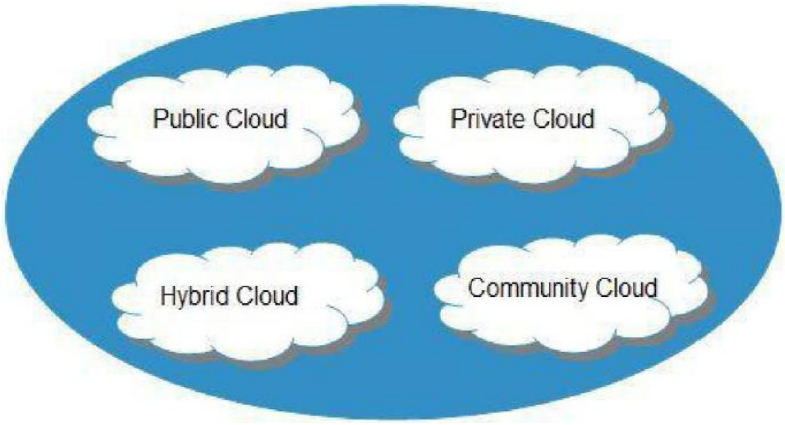
Basic Concepts

There are certain services and models working behind the scene making the cloud computing feasible and accessible to end users. Following are the working models for cloud computing:

1. Deployment Models
2. Service Models

Deployment Models

Deployment models define the type of access to the cloud, i.e., how the cloud is located? Cloud can have any of the four types of access: Public, Private, Hybrid and Community.



PUBLIC CLOUD: The Public Cloud allows systems and services to be easily accessible to the general public. Public cloud may be less secure because of its openness, e.g., e-mail.

PRIVATE CLOUD: The Private Cloud allows systems and services to be accessible within an organization. It offers increased security because of its private nature.

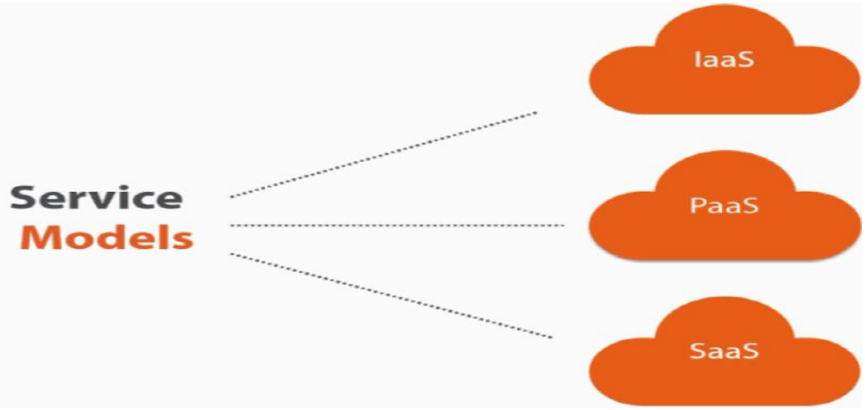
HYBRID CLOUD: The Hybrid Cloud is mixture of public and private cloud. However, the critical activities are performed using private cloud while the non-critical activities are performed using public cloud.

COMMUNITY CLOUD: The Community Cloud allows systems and services to be accessible by group of organizations.

Service Models

Service Models are the reference models on which the Cloud Computing is based. These can be categorized into three basic service models as listed below:

1. Infrastructure as a Service (IaaS)
2. Platform as a Service (PaaS)
3. Software as a Service (SaaS)



Infrastructure as a Service (IaaS)

IaaS is the delivery of technology infrastructure as an on demand scalable service. IaaS provides access to fundamental resources such as physical machines, virtual machines, virtual storage, etc.

- Usually billed based on usage
- Usually multi-tenant virtualized environment
- Can be coupled with Managed Services for OS and application support

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IaaS Examples

Platform as a Service (PaaS)

PaaS provides the runtime environment for applications, development & deployment tools, etc. PaaS provides all of the facilities required to support the complete life cycle of building and delivering web applications and services entirely from the Internet. Typically applications must be developed with a particular platform in mind

- Multi-tenant environments
- Highly scalable multi-tier architecture

PaaS Examples

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Software as a Service (SaaS)

SaaS model allows using software applications as a service to end users. SaaS is a software delivery methodology that provides licensed multi-tenant access to software and its functions Remotely as a Web-based service.

- Usually billed based on usage
- Usually multi-tenant environment
- Highly scalable architecture

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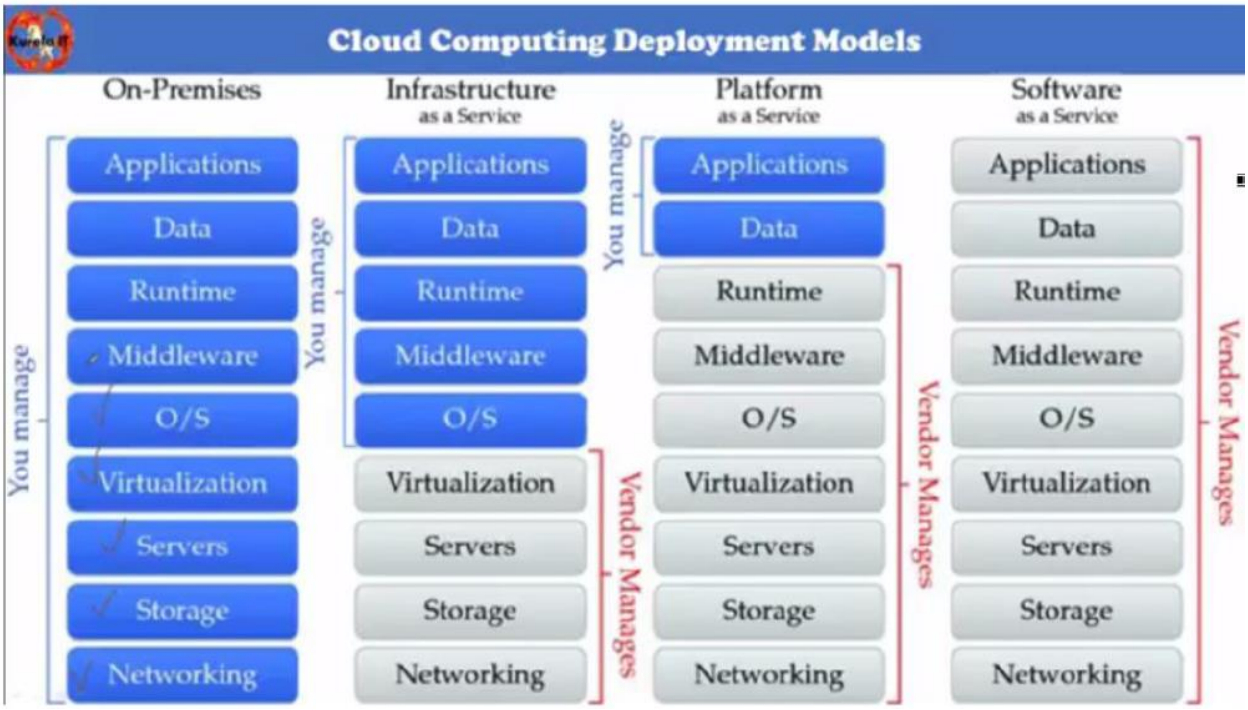

Do you Use the Cloud?

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AWS Certification Tracks

Three tracks:

1. Solution Architect
2. Developer/DevOps
3. Sysop Administrator

Two levels:

1. Associate (entry level)
2. Professional (Expert level)

AWS Link: https://aws.amazon.com/certification

Sysop: How to implement, manage stuff, troubleshooting. (Not designing)
DevOps: Built applications on top of the AWS platform/services.
Solution Architect: Design- What is the ideal way to rolling out application.

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AWS Certified Solutions Architect - Associate (SAA-C02)

Total Questions: 65
Time: 130 Minutes
Mode: Online and Multiple Choices

- 1 Correct Answer of 4 choices
- 2 Correct Answer of 5 choices

Passing Marks: 720/1000
Stages: Easy Questions, Complex Questions and Unknowns
No Weighted for each Question
No Partial Marking

Introduction to Amazon AWS Services

In 2006, Amazon Web Services (AWS) began offering IT infrastructure services to businesses as web services—now commonly known as cloud computing. One of the key benefits of cloud computing is the opportunity to replace upfront capital infrastructure expenses with low variable costs that scale with your business. With the cloud, businesses no longer need to plan for and procure servers and other IT infrastructure weeks or months in advance. Instead, they can instantly spin up hundreds or thousands of servers in minutes and deliver results faster.
Today, AWS provides a highly reliable, scalable, low-cost infrastructure platform in the cloud that powers hundreds of thousands of businesses in 190 countries around the world.

Prerequisites:

- AWS fundamentals.
- Microsoft and Linux operating system essentials.
- Networking Essentials. IP Address, subnets, Load Balancer and routers etc.
- Working knowledge of virtualization.
- Storage fundamentals.

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Understanding AWS Global Infrastructure

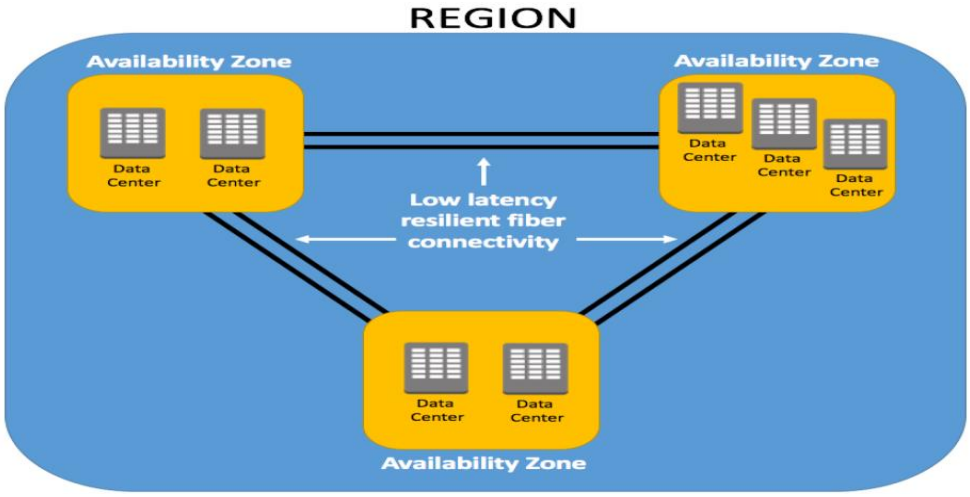
Amazon web services (AWS) is a global public cloud provider, and as such, it has to have global network of infrastructure to run and manage its many growing cloud services that support customers around the world. In this post, we will look at the components that make up the AWS global Infrastructure.

To Understand AWS Global Infrastructure, you need to understand following concepts and components:

1. Regions.
2. Availability Zone (AZs).
3. Edge Locations.
4. Regional Edge Locations.

The number of regions is increasing year after year as AWS works to keep up with the demand for cloud computing services. At the time of publishing this article (Nov-2019), there are currently.

1. 22 Regions
2. 69 AZs.
3. 189 Edge Locations
4. 11 Regional Edge Locations

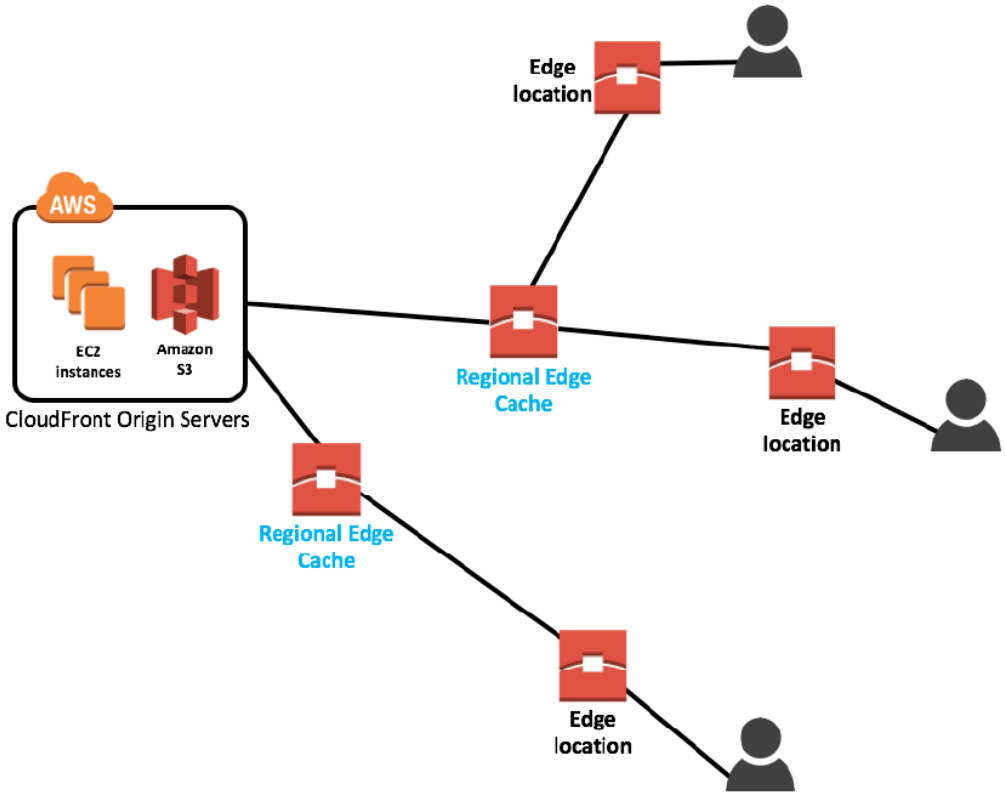


Edge Locations

A site that CloudFront uses to cache copies of your content for faster delivery to users at any location. Edge locations are AWS sites deployed in major cities and highly populated areas across globe.

Regional Edge Locations/Cache

In Nov-2016, AWS announced a new type of edge location, called a regional edge cache. These sit between your CloudFront origin servers and edge locations. A regional edge cache has a larger cache width than each of the individual edge locations and because data expires from the cache at the edge locations, the data is retained at the regional edge cache. Therefore, when data is requested at the edge location that is no longer available, the edge location can retrieve the cached data from the regional edge cache instead of the Origin servers, which would have a higher latency.



How to choose region

Latency Check: https://www.cloudping.info

AWS Sign UP

A Valid Credit/Debit Card is required for account validation.

Official Website URL: https://aws.amazon.com

Verification:

1. Phone Verification: Phone verification. (Name, Email Address, Phone Number).
2. Payment Method: Update or add billing method.

AWS Terminology

AWS	Industry
EC2 Instances	Virtual Machines / Servers
Amazon Machine Image (AMI)	Template (OVA, OVF)
Elastic Block Storage (EBS)	Volume / Hard Disk / Virtual Disk
Ephemeral Storage	Temporary Storage
Simple Storage Service (S3)	Object-based Storage
EC2 Compute Unit (ECU)	Measure of EC2 Processor
vCPU	Virtual CPU
Identity and Access Management (IAM)	Delegated Administration
Elastic Load Balancer (ELB)	Load Balancer
Route 53	DNS

Launching your first EC-2 Instance

Quickly create an EC2 Instance with Default options.

1. Windows
2. Linux

- An instance is a virtual server in AWS Cloud.
- AMI (Amazon Machine Image) serve as templates for your instance.
- You secure it by specifying a key pair and security group.
- When you connect to your instance, you must specify the private key of the key pair that you specified when launching your instance.

Key pair file is use to connect with your instance. This is the only chance for you to save the private key file so be sure to download it. Save the private key file in a safe place.

Connecting with Linux Instance:

Access Linux Instance using SSH.

1. Browser Java client. (You must have installed and enabled in browser)
2. Using putty.
3. Using SSH Client.
4. Using Winscp/FileZilla.

Important:

You cannot connect to your unless you launched it with a key pair for which you have the .pem file and you launched it with a security group that allow SSH access.
Connecting using putty:

Putty does not natively support the private key format (.pem) generated by amazon EC2. Putty has a tool named PuttyGen, which can convert keys to the required Putty Format (.ppk).

.pem to .ppk

You must convert your private key into this format (.ppk) before attempting to connect to your instance using Putty. In the hostname box, enter Public IP/Public DNS Name and appropriate user name for your AMI.