Amazon Web Services (AWS) Training

**About the course**

This course provides information on Amazon Web Services (AWS), their features and characteristics as well as how and why to use them. The AWS training in Ameerpet introduces you to AWS and cloud computing to provide you with the necessary information to make informed decisions based on your business needs.

AWS Course Objectives

The AWS training in Hyderabad course provides you with:

* An introduction to AWS and basic cloud computing
* The ability to understand AWS terminology as used in documentations
* A clear and deeper understanding of the services offered by the AWS cloud
* An understanding of AWS security measures
* Knowledge in the utilization of AWS features and services

**Who should take this course?**  
This AWS training in Hyderabad Ameerpet course should be taken by:

* People who are responsible for offering AWS related services or training to clients
* People who want to learn more about AWS
* People who have an interest in the services offered by the AWS cloud

**Why learn Amazon Web services?**  
Amazon Web Services provide a platform on which most of the web services and products are offered. By learning AWS you place yourself in an opportune position to understand, utilize and profit from it. As web dynamics keep changing in favor of cloud computing, the need for people with sufficient knowledge of AWS is ever increasing. More so, by learning AWS you are more capable of understanding how to run applications and services that you need, how to get them and so on. The best AWS training in Hyderabad gives you the upper hand in most computing fields that rely on cloud computing.  
**What are the prerequisites for this course?**  
This is an on-demand Amazon AWS training in Hyderabad course, which means that anyone is eligible to join and learn, with or without prior knowledge. However, you are at a better learning advantage if you:

* Have basic knowledge of computer and networking
* Have basic knowledge of distributed systems and general working concepts
* Understand Multi-tier architectures
* Have basic knowledge in cloud computing

**How will I execute the Practical?**  
Practicals make up a huge part of the subject matter in AWS certification training in Hyderabad. Even though this handbook is theoretical, there will be countless practical sessions and lessons in the training. The practicals will be centered around ensuring that you understand how to utilize the theoretical knowledge that you have gained. You should also learn to practice more of what you learn by yourself to increase and reinforce your understanding.

**Amazon Web Services (AWS) Cloud Services**

Introduction to AWS Cloud Services

AWS cloud services are a suite of cloud computing services that are offered under Amazon.com's AWS subsidiary. The services are provided from about 16 regions in the world, with more to be introduced in 2017 and include storage, analytics, database, compute and up to 70 others. The intention of AWS in running cloud services is to provide fast access to a large computing capacity at an affordable price for clients.  
**What is Cloud Computing?**  
Cloud computing is a computing model, based out of the internet, that allows the sharing of resources between configurable computers. It enables one to use remote servers and infrastructure on the internet, instead of local servers and infrastructure, for the processing, storage, and management of data.  
**History of Cloud**  
Cloud computing began as far back as the '60s. Some people trace it back to the ARPANET and CSNET, which were the predecessors of the internet, while others attribute it to various instances of mention over the years as computers and the internet grew. One of the earliest instances was in the '70s with the Remote Job Entry feature introduced for use by large companies such as IBM. However, the greatest acclaim to cloud computing can be given to Salesforce.com, who in the late '90s introduced what would be the pioneering beginning of modern cloud computing, with their delivery of applications over the internet to end users. The next critical mention was Amazon's web services in 2002, to provide a number of cloud services including storage and computation, among others through Amazon Mechanical Turk. From there cloud computing grew into what it is today, with more companies realizing the benefit and taking it up.  
**Different versions for Cloud**  
The cloud is classified in two ways based on its location or the services offered.  
When based on location, you have:

* Public - The cloud services are offered to and can be accessed by anyone in the general public over the internet. The end user does not have ownership of the cloud infrastructure but rather it is owned by one or more organizations that provide the services.
* Private - A single organization has exclusive access and use of cloud infrastructure. The ownership, management, and operation of the infrastructure are either by the organization, a third party or both. The third party hosts the cloud infrastructure through data centers.
* Community - Organizations or parties with common interests manage cloud infrastructure, hosted through third party data centers to provide cloud services to a community.
* Hybrid - This is a combination of all other cloud models and has all the advantages of the other models while addressing the weaknesses.

**When based on services, you have:**

* Infrastructure as a Service (IaaS)
* Platform as a Service (PaaS)
* Software as a Service (SaaS)

**IaaS overview**  
Infrastructure as a Service is a form of cloud computing where virtual computer infrastructure and resources are offered over the internet. Basically, all the physical infrastructure required for computing is offered virtually.  
**PaaS overview**  
Platform as a Service is a form of cloud computing where programming languages and development environments are provided on virtually so that such things as storage space of a database and other requirements are no longer an issue.  
**Saas overview**  
Software as a Service is a form of cloud computing where a certain software or database is provided for use by an end-user. The services are usually pay-per-use or as a subscription. The end user, therefore, does not have to run the software on a local device to gain access to it.

Why choose Amazon Web Services (AWS) cloud

Flexibility  
Instead of paying for a service that takes forever to learn and familiarize with the AWS cloud offers flexibility by offering a free tier. You get a free monthly trial with full access to all the cloud infrastructure and you can then use this time to learn more and get familiar with AWS.  
Pricing  
With AWS cloud, you only pay for the amount of service that you use. You, therefore, don't have to pay for expenditure that you are not responsible for, more so in a setting where other users could be using more cloud capacity than you. That said, you are also in a position to control expenditure by regulating your usage.     
Performance  
The AWS cloud architecture is designed in such a way that you get constant load-bearing service that adjusts according to your needs. The consistent and reliable performance is a huge plus for the AWS cloud. Besides that, you get different services to choose from, greater control over the services you are running and so much more.     
Security  
AWS cloud runs multiple tiers of security protocols to give security to the clients, their accounts, and services.  
Speed  
Instances that would take hours to launch on other cloud servers only take a few minutes to launch on AWS cloud. This is due to the architecture and framework that is designed to offer more capacity at increased speed.  
**AWS Architecture**  
The AWS architecture is set up in 16 different geographical locations all around the world. This allows for the servers to provide the needed services within a specific region without collapsing and failure. The architecture can also be configured more easily to meet the client needs at the moment.  
The architecture is divided as follows:

* Asia Pacific - 6 regions
* America - 7 regions total, with 6 being in North America
* Europe - 1 region
* Middle East - 1 region
* Africa - 1 region

**Features of Amazon Web Services (AWS) Cloud**  
The AWS cloud provides various cloud services, each with a different feature. Some of these features include:  
The Web and mobile applications  
Game development

* Data processing
* Storage

**AWS Console**  
**Amazon Web Services (AWS) Management Console**  
The AWS management console is a simple web-based interface that allows for easy access and management of AWS. It has a number of features including:

* Account administration - Allows you to monitor and manage your AWS account. Such features as security credentials and payment monitoring among others are included.
* Service center - Through this, you can find and select the services that you need from AWS. There is a search option to ease the process of finding services and a drag and drop feature allows you to pin your services on the toolbar.
* Resource groups - You can create resource groups for your applications using tags to ease navigation. You can edit tags and resources to preference as they are user-specific.
* Learning center - This allows you to learn more about AWS and how to use it using features such as videos, tutorials, guides among others.
* Mobile support - There is a mobile app that allows you to monitor and manage your AWS account through your phone.

**Amazon Web Services (AWS) plugins**  
AWS cloud services have two different plugins. These plugins allow for the customization of cloud services by the end user to preference. They include:  
EC2 Discovery Plugin  
S3 Repository Plugin  
**Amazon Web Services (AWS) CLI**  
The Command Line Interface (CLI) is an all-inclusive management tool that allows you to download, configure, automate using scripts, and control all your services.  
**Amazon Web Services (AWS) Blogs/Documentation**  
For more information, visit the following sites  
http://docs.aws.amazon.com/gettingstarted/latest/awsgsg-intro/awsgsg-intro.pdf  
https://aws.amazon.com/

AWS Web Services

1. Amazon Elastic Compute Cloud (EC2) (Complete)

Amazon Elastic Compute Cloud (EC2) is a web service which allows the user to configure and adjust the capacity in the cloud with minimal effort and time. It provides the user with the total control to run Amazon's computing environment, reducing the time it takes to obtain a new server and boot it to within minutes. This allows the user to adjust capacity up and down depending on changes to computing resource requirements. If the user is a developer, Amazon EC2 also enables the development of applications that are tested and resilient against common failures. More so, it enables you to pay for only the services or capacity that you use.  
**Different instance types**  
Instance types are configured to have different combinations of memory, networking capacity, CPU, and storage so as to offer the user flexibility in choosing the right resources for running applications. EC2 has different instance types divided into general purpose, compute optimized, memory optimized, accelerated computing and storage optimized categories

General purpose instance types

T2

* CPU operates at a baseline level but has the ability to burst above the baseline.
* CPU performance is governed by CPU credits accumulated while idle and used up when active.
* Lowest cost instance type
* Memory, network resources and compute are all balanced
* Applicable to websites and web applications, micro-services, development environments, test and staging environments etc.

M4

* Storage capacity (EBS) is optimized by default with no additional costs required
* Run on considerably high-frequency processors
* Support enhanced networking
* Memory, network resources and compute are all balanced

M3

* Run on very high capacity storage for high powered and fast performance
* High-frequency processors
* Memory, network resources and compute are all balanced
* Applicable in small to mid-size databases, caching fleets, cluster computing etc

Compute-optimized instance types

C4

* High-frequency processors and low price compute
* Storage capacity (EBS) is optimized by default with no additional costs required
* Offers support for clustering and enhanced networking
* Can control processor states (C and P)

C3

* High-frequency processors and low price compute
* Offers support for clustering and enhanced networking
* High capacity storage
* Applicable in MMO gaming, high-performance engineering and science applications, web servers etc

Memory optimized instance types

X1

* High-frequency processors and lowest price for each GiB of RAM
* High capacity DDR4 memory of up to 1952 GiB
* Storage capacity (Both SSD and EBS) is optimized by default with no additional costs required
* Can control processor states (C and P)
* Applicable in running memory databases, high-performance computing applications, data processing engine etc

R4

* High-frequency processors
* High capacity DDR4 memory
* Supports enhanced networking
* Applicable in data mining and analysis, memory databases, enterprise applications etc

R3

* Optimized to run memory-intensive applications at a lower price for each GiB of RAM
* High capacity SSD memory
* Supports enhanced networking
* Applicable in high-performance databases, in-memory analytics, enterprise applications etc.

Accelerated computing instance types

P2

* High-frequency processors
* High-performance GPUs, with high parallel processing (2,496) and  GPU memory (12 GiB)
* Supports peer-to-peer GPU communication
* Storage capacity (EBS) is optimized by default with no additional costs required
* Supports enhanced networking
* Applicable in machine learning, high-performance databases, computational finance, genomics etc

G2

* High-frequency processors
* High-performance GPUs, with high parallel processing (1536) and  GPU memory (4 GB)
* GPUs feature onboard video encoders for HD video streams
* Low-latency frame capture for high-quality streaming
* Applicable in video encoding, 3D application streaming etc.

F1

* Customizable hardware with Field Programmable Arrays (FPGAs)
* High-frequency processors
* Supports enhanced networking
* High capacity NVMe SSD storage
* Applicable in genomics, security, financial analysis etc

Storage optimized instance types

I3 (High Power Instances)

* High-frequency processors
* High capacity NVMe SSD storage
* Supports enhanced networking and TRIM
* High random power performance and sequential read throughput
* Applicable in in-memory analytics, NoSQL databases, data warehousing etc

D2 (Dense storage instances)

* High-frequency processors
* High capacity HDD storage
* High-performance consistency during launch time
* Supports enhanced networking
* High disk throughput
* Applicable data warehousing, network file systems, data processing applications etc

AMIs  
Amazon Machine Images (AMIs) contain and provide the information necessary for the launch of an instance. Instances are virtual servers in the cloud and you must, therefore, specify an AMI to launch the instance. Multiple instances can be launched from a single AMI or from multiple AMIs.  
An AMI includes the following:

* Launch permissions with controls for which AWS accounts should be able to use the AMI to launch instances.
* A template for root volumes of the instance, such as an Operating System, application or application server.
* A block device mapping which specifies the volumes that are to be attached to an instance during launch.
* You can use an AMI to launch instances after creating it, or after being given access/permissions by its owner. An AMI can also be copied to a region where an instance was launched or other regions. There are AWS AMIs and some provided by the AWS community that you can also use. You can buy or sell AMIs at will from or to third parties or other AWS users. After use, you can just deregister the AMI.

Volumes  
Volumes are block-level storage devices which can be attached to instances. When attached to instances, volumes can be used like physical drives. However, you can change the dynamics of a volume to grow it, change the types, and modify the provisioned capacity. The volumes exist independently of the running instance and they can be used as storage for data requiring frequent updates, storage for a running database application or storage for applications performing continuous disk scans. There are different kinds of volumes, with differences in pricing and characteristics and they include:  
General purpose SSD

* Provisioned IOPS SSD
* Throughput Optimized HDD
* Cold HDD
* Magnetic

Snapshots  
A snapshot is an incremental backup to which you can backup the data contained in volumes. By being incremental, only the most recent backup data is saved, thereby minimizing cost and time that would have been spent re-creating the entire backup. It is possible to create a volume from an existing snapshot, and the created volume will contain all the information of the previous volume that was used to create the snapshot. Snapshots can be copied and shared by multiple accounts as long as, the users have the permissions from the creator. The data remains encrypted if the snapshot is created from an encrypted volume or vice versa. You can also encrypt or re-encrypt the snapshot while copying it. They are tied to the region where they are created by they can be copied to different regions.  
EIPs  
Elastic IP addresses (EIPs) are public, static IPv4 addresses that can be associated with any network interface or instance to create a Virtual Private Cloud (VPC) in the AWS account. This allows you to remap the address to a different instance rapidly, in the event of the failure in an instance. It is more advantageous to associate the EIP with a network interface rather than an instance for that same reason, or more elaborately since it allows a single-step transfer of the address and its attributes to another instance.  
Key Pairs  
Key pairs are used for the encryption and subsequent decryption of login data in the Amazon EC2. A public key encrypts the data while a private key used by the recipient decrypts it to allow access, with the public and private keys being the key pair. Logging into instances requires the creation and use of a key pair.  
Security Groups  
Security groups are virtual firewalls, which regulate the flow of traffic to or from one or more instances, based on the defined rules. You have to add and define rules to a security group to determine how traffic is regulated in the instances it is associated with. The rules can be modified to preference at any time.  
Network Interfaces  
These are virtual network interfaces attached to an instance in a VPC and they can be willfully attached and detached to and from an instance. They enable the flow of network traffic to the instance that they are attached to and the number of network interfaces that can be attached to an instance depends on the type of instance. The attributes of the network interface shift from instance to instance as it is attached or detached. All instance types support private and public IPv4 address network interfaces but only some support IPv6 address network interfaces.  
Load balancers  
There are two types of load balancers both featuring high availability, extensive security, and auto-scaling. Load balancing is the distribution of incoming traffic to multiple instances enabling fault tolerance in running applications.  
Classic load balancer - Traffic is routed based on either network or application level information, making the classic load balancer great for simple load balancing.  
Application load balancer - Traffic is routed based on advanced application level information, making the application load balancer great for applications that need advanced routing, container-based architecture, and micro-services.  
Auto scaling  
Auto scaling allows you to scale the EC2 capacity automatically depending on your requirements, which maintains application availability.  
Tags  
These are metadata assigned to instances, AMIs and other EC2 resources for easier handling and management.

2. Amazon Web Services (AWS) S3

What is S3?  
The AWS Amazon Simple Service Storage (S3) is an internet-based storage designed to make web-scale computing easier. The S3 interface allows the willful and unconstrained storage and retrieval of any kind of data, giving developers access to reliable, highly scalable, inexpensive and fast storage infrastructure.  
Buckets and objects  
Objects are files and data uploaded to Amazon S3, and buckets are where these objects are stored. You must create a bucket before using Amazon S3 to store data. There is no restriction to how many objects you can store in a bucket.  
Pre-signed URL  
A pre-signed URL provides access to an object that is linked to the URL so long as the creator of the pre-signed URL has permissions for accessing the object. They are useful in cases where you want a client to upload a certain object to your bucket without having AWS credentials. The pre-signed URL is only valid for a given duration.  
Permissions  
Permissions are security credentials that give other users access to your S3 resources, such as buckets and objects, which are private by default.  
Distributions  
Distributions are content, S3 resources or stream media files with their origin as an S3 bucket or HTTP server, that are provided to other AWS users or clients with or without AWS credentials.  
Relation between CloudFront, S3, and Glacier  
In the event that you wish to distribute the content that is stored in Amazon S3 buckets, instead of providing direct access to your S3 buckets, you could use Amazon CloudFront, which enables cost-effective distribution especially if there is frequent access to the objects. Amazon S3 allows fast access and retrieval of data but at a high price when compared to Amazon Glacier, which is also a storage service but with very slow retrieval. By archiving your data to Amazon Glacier, you get to leverage the cheap pricing, while ensuring that you can gain fast access and retrieval through Amazon S3 when needed.

3. Amazon Virtual Private Cloud (VPC)

VPC basics  
The Amazon Virtual Private Cloud (VPC), provides you with private access to a virtual network in the AWS cloud from where you can run your services, resources, and applications. The VPC gives you total control over the virtual networking environment such as the creation of subnets, selection of the IP address range, network gateways etc. The VPC allows a use of both IPv4 and IPv6, provides multiple layers of security and helps you control access to instances in the created subnets. A VPC spans across all the AWS availability zones within a region.  
Public subnets and private subnets  
A subnet is a part of the VPC that exists within one availability zone in the region. A public subnet is one in which network traffic is routed to an internet gateway, while a private subnet is one where the network traffic is not routed to an internet or external gateway.  
Network ACLs  
Network Access Control Lists (ACLs) are an additional and optional layer of security available for VPCs, which acts as a firewall to control traffic through the subnets.  
Difference between Network ACL and security groups

* Security groups only apply to instances, while Network ACLs apply to subnets. Therefore, all instances within a subnet are subject to the Network ACL associated with that subnet. In other words, a security group has to be specifically assigned to an instance for it to apply while a Network ACL applies to all instances running in a subnet associated with a Network ACL.
* For a security group, you don't have to define every rule for it to apply to both inbound and outbound traffic, while for a Network ACL, you have to state and define each rule in relation to inbound and outbound traffic. In other words, Network ACLs are stateless while security groups are stateful.
* A Network ACL follows a numerical order in the execution of rules, which means that a rule listed with a high numerical order number, say number 1 for instance, gains precedence over other rules that follow. For a security group, on the other hand, each rule is evaluated based on what it is related to, giving a more comprehensive security solution.
* Only one Network ACL can be associated with a subnet while multiple security groups can be applied to a single instance.

Route tables  
Route tables, which are associated with a subnet, contain sets of rules known as routes that are used in the determination of where network traffic is to be directed. Multiple subnets can be associated with a single route table, while only one route table can be associated with a single subnet at a time.  
Internet gateways  
An internet gateway supports both IPv4 and IPv6 traffic and is a VPC component, which allows communication between instances within the VPC and the internet. An internet gateway provides a target in the route tables for internet traffic that can be routed as well as, performing Network Address Translation for instances with an IPv4 address.  
DHCP option sets  
A Dynamic Host Configuration Protocol (DHCP) enables there to be a standard for passing configuration information to hosts on a TCP/IP network based identified parameters such as Domain Name and Domain Name Server, among others. These parameters are known as Options and a group of them is what is known as an Option Set. Option sets are linked to the AWS account for use across all your VPCs. The DHCP options sets include:

* Domain name servers
* Domain name
* Network Time Protocol (NTP) servers
* NetBIOS name servers
* NetBIOS node type

Launch servers with VPC  
For more information on this, please visit: http://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/VPC\_Scenario1.html as well as http://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/VPC\_Scenario2.html

4. Identity and Access Management (IAM)

Identity and Access Management provides the user with the ability to control access to AWS resources and services. One can create and manage account users and groups, using permissions to either grant or deny access to resources.  
Basics of AWS permissions  
Permissions allow you to specify who can gain access to AWS resources and the extent of the access. By default, the users can do nothing with their account. However, you can increase access and define the reach of each user by offering permissions. The permissions link the user to the resource under the defined parameters. These permissions are in form of access keys.  
Roles  
Roles define what a user can and can't do even though they are not associated with any one user. Instead, the roles are available for any and all users who need them. As soon as a user is assigned a role, an access key is created to grant the user permissions to access that role.  
Profiles  
An instance profile contains information related that is passed to an EC2 instance for the role. When a role is created, an instance profile with the same name is also created. When an EC2 instance is launched with the role, you have the option of associating the role with the EC2 instance. Roles that do not have an association with Amazon EC2 do not have instance profiles.  
Policies  
A policy is a document that identifies, details and lists all the permissions associated with a user, role, group or resource. It allows you to specify the actions, resources, and effect associated with the user or group and the role or resource.  
MFA  
Multi-Factor Authentication (MFA) provides an extra layer of protection on the username and password. When logging in, the user has to provide a username and password associated with the account. Then a code is sent to a registered device, which acts as the second layer of protection.  
User permissions  
These are the permissions that are assigned to a user to grant access to certain roles and resources. The extent of access depends on the kind of user permissions that have been granted. A single and specific user receives user permissions and they are tailored to meet specific user needs  
Groups based  
Group based permissions, much like user permissions grant full or controlled access to roles and resources. The differentiating factor is the fact that for group based permissions, the permissions are for a number of users and not just one. They are therefore general and apply to all users in the group in the same way.  
AWS key and Secret key  
To grant a user access to the AWS CLI, you have to create an access key. Once the access key is created, a secret key is also assigned. The secret key is created only once and is necessary for login. If lost, it cannot be recovered and the corresponding access key has to be deleted. You can create many access keys and rotate them from user to user for greater security.

5. DynamoDB

This is a flexible and fast NoSQL database service provided for applications which require single digit millisecond, consistent latency. It supports both key-value and document store models and is ideal for gaming, mobile, web, and other applications.  
What is NoSQL technology?  
NonSQL or NonRelational database technology provides mechanisms for the storage and retrieval of data modeled in ways other than the tabular relations and other data structure used by relational databases. The difference in data structures allows for simpler design and horizontal scaling of clusters for finer and faster control of data.  
DynamoDB capacity  
The read and write capacity of DynamoDB is a consistent read per second for 4KB and a write per second for 1KB respectively. Where you need to read or write more, you will have to consume more capacity, which should be defined in your tables.  
Create table and do a sample project  
For more information, please visit: http://docs.aws.amazon.com/amazondynamodb/latest/developerguide/AppendixSampleTables.html

6. Route 53

This highly scalable and available Domain Name System (DNS) service offers cost-effective ways for developers to route their end users to internet applications. It connects users to AWS infrastructures such as Amazon EC2 instances, Amazon S3 buckets, Elastic load balancers and others. It also allows for easy management and routing of traffic globally as well as running DNS checks to make sure that your applications are routed to healthy endpoints.  
Hosted zone  
This container holds relevant information on how you want traffic to be routed through a domain, sub-domain or the internet. When the information to be routed is for the internet, it becomes a public hosted zone and if it isn't then it is a privately hosted zone.  
Type (CName, IP address, MX)  
Amazon 53 supports a number of record types including:

* An (address record)
* AAAA (IPv6 address record)
* CNAME (canonical name record)
* MX (mail exchange record)
* NAPTR (name authority pointer record)
* NS (name server record)
* PTR (pointer record)
* SOA (start of authority record)
* SPF (sender policy framework)
* SRV (service locator)

Change references to meet CName  
For more information on changing and editing resource sets please visit: http://docs.aws.amazon.com/Route53/latest/DeveloperGuide/resource-record-sets-editing.html and http://docs.aws.amazon.com/cli/latest/reference/route53/change-resource-record-sets.html

7. Amazon Simple Email Service (SES)

The Amazon Simple Email Service (SES) is an email service that allows for the sending and receiving of emails without limits. Payment is only for what you use. This provides and effective, reliable and cost-effective email service for AWS users.  
Email services  
Amazon SES offers a variety of email services including:  
Marketing emails  
You can use SES to send advertisements, quality content, offers and other marketing tools to promote your products and services.  
Notifications  
You can use SES to receive useful notifications pertaining to the functioning of your applications, instances and other AWS cloud resources such as error alerts, reports, status updates, and others.  
Transactional emails  
You can use SES to send automated transactional reports to your clients such as order updates, policy changes, and others.  
Receiving emails  
You can use SES to receive messages and even go so far as to upload them to an Amazon S3 bucket or execute other functions.  
SMTP servers  
Sending emails through Amazon SES utilizes either Amazon API or Simple Mail Transfer Protocol (SMTP). When using the Amazon SES SMTP interface, you use SMTP-specific programming language, email servers or applications. SMTP servers provide the protocols necessary for email traffic to flow back and forth between you and your clients.

8. Amazon Simple Queue Service (SQS)

The Amazon Simple Queue Service (SQS) is a message queuing service that provides efficiency in communication between different micro services and software components. The sending, storage, and retrieval of messages across different software components ensure that there is definite receipt of messages and eliminates the need for investing in additional messaging software.  
Queue creations  
Queue creations allow the messages to be ordered, thereby making it easier to guarantee delivery of messages at least once and in the order that they are queued.  
Retention periods  
The retention period refers to the amount of time allowed for a message to stay in a queue by Amazon SQS. The default retention period for a message is 4 days. Nevertheless, you can adjust the retention period at will to be between 1 minute and 14 days.  
Dead letters  
Amazon SQS has a provision for a dead letter queue, which is a queue that other queues can send messages to in the event of the failure in processing. That way, you can review the messages that are in the dead letter queue and determine why their processing was unsuccessful. Each dead letter queue has to be specific to the original queue. For instance, a standard dead letter queue can only receive messages from a standard queue. Dead letter queues can be created through the query API or the AWS Management Console.

9. Amazon Simple Notification Service (SNS)

The Amazon Simple Notification Service (SNS) is a push service that enables you to send individual or group messages.  
Topic  
This is a communication channel for the sending of messages and subscription to notifications.  
Subscriptions  
To receive notifications or messages pertaining to a certain topic, you have to subscribe to that topic through an endpoint. An endpoint is a channel that can receive the notification such as a mobile app, email address or web server, among others.  
Notifications and applications  
SNS notifications can be sent through applications as the endnote. In this case, the application works as a recipient of the notifications from a certain topic, sent through Amazon SNS.

10. CloudWatch

This service allows you to monitor you AWS resources and applications that are run through AWS. It enables you to track and collect metrics, monitor and collect log files, react automatically to changes in your resources and set alarms. Using CloudWatch allows you to view resource utilization, operational health and application performance.  
Different metrics  
Some of the metrics you can monitor using Amazon CloudWatch include:

* AWS Namespaces
* API Gateway
* Auto Scaling
* AWS Billing and Cost Management
* Amazon CloudFront
* Amazon EC2
* Amazon S3
* Elastic Beanstalk
* Amazon ElastiCache
* Elastic Load Balancing
* Amazon Kinesis Analytics
* Amazon WorkSpaces

Monitoring  
CloudWatch provides extensive monitoring of metrics for all AWS resources including custom metrics. The metrics can be stored or shared and used to gauge performance, identify trends or troubleshoot.  
Custom metrics  
Custom metrics are those that are generated by personal applications and you can have them monitored through CloudWatch by submitting an API request.

11. AWS CloudFormation

AWS CloudFormation enables easy creation and management of AWS resources for easier and orderly provisioning and updates, through the creation of templates.  
CloudFormation templates  
The templates detail and govern the AWS resources to be provisioned and updated by AWS CloudFormation.  
Complete resources and explanation with sample templates  
For more detailed information and sample templates, visit https://aws.amazon.com/cloudformation/aws-cloudformation-templates/

12. Amazon CloudFront

Amazon CloudFront is a Content Delivery Network (CDN) set up globally, which speeds up delivery of websites, web assets, video content, and APIs, among others. Its integration with other AWS products helps give an easy way for users to quickly deliver content to their clients.

13. AWS  CodeDeploy

AWS CodeDeploy is part of AWS deployment services and it coordinates the deployment of applications to on-premises instances or Amazon EC2 instances or both.  
Why CodeDeploy?

* Extensive compatibility - CodeDeploy is compatible with all applications eliminating the need for yet another application deployment service.
* High regulation - CodeDeploy can be used to control the deployment of an application across instances, enabling progressive upload with a completion of each stage.
* Central control - The deployment progress can be tracked after launch. All the functions are controlled from the AWS CodeDeploy console making it easy to use.

How to apply patch with CodeDeploy  
Create the patch with all the necessary updates and then redeploy the application using CodeDeploy. After that, you can review the changes to the application.

14. Workspaces

This service provides desktop computing services over the cloud enabling you to run virtual desktops and provide multiple users with access to information, applications, and resources on a single supported computer. The service can be paid for monthly or by usage, enabling you to save more.

15. Amazon Glacier

Amazon Glacier is a cloud storage service used primarily for long-term backup and archiving. It is secure, very affordable and durable. The data retrieval process takes anywhere from a few minutes to hours.

16. Cloud Trail

This service enables you to log, monitor and retain events that are related to API calls throughout your AWS infrastructure, thereby enabling compliance, governance as well as risk and operational auditing in your AWS account. A history of all API calls is provided which simplifies troubleshooting, security analysis, and resource change tracking.

17. Amazon Web Services (AWS) Config

This service provides the user with configuration history, AWS resource inventory and configuration change notifications enabling governance and security. It enables the creation of rules to automatically analyze the configuration of AWS resources through the Config Rules. More so, you can determine compliance with rules, discover deleted and existing resources and look into configuration details of a resource for compliance auditing, resource change tracking, security analysis and troubleshooting.  
**Conclusion**  
Successful completion of the AWS cloud computing training in Hyderabad Ameerpet requires great conceptualization of the theory and implementation in practicals. It is, therefore, important that for AWS DevOps training in Hyderabad, you take the initiative to explore the practical section of this AWS training in Hyderabad Ameerpet, beyond what you will learn in AWS training institutes in Hyderabad. That said, it is also important to expand on the theoretical knowledge gained from the Amazon AWS training in Hyderabad course by visiting the provided links and documentation.