AWS Questions:-

**Q1). What is Cloud Computing?**

Cloud is like a third-party server where we can store data big data, no hardware software needed, if you have internet you can work from anywhere just like Gmail. E.g.- Gmail, you go to the browser type Gmail and enters credentials and can access it from anywhere.

**Q2). What are the attributes of Cloud Computing?**

Here are a few attributes of Cloud Computing-

* Multi-tenant
* Subscription
* No large setup fee
* Fixed, predictable cost
* Scales with your business
* Automatic Upgrade

**Q3). Why go, cloud-based?**

Here are the reasons why you should consider cloud computing as a developer. A cloud system takes care of your Network, storage approach, Operating System, database, etc. infrastructure related services all by itself and you need not bother. It helps you weave up quick applications that itself takes care of Security, sharing of the apps, integration models, etc. you get inbuilt in cloud apps.

**Q4). Describe the definition of AWS?**

AWS means the [Amazon Web Service](https://www.janbasktraining.com/blog/what-is-aws/); it is a gathering of remote computing facilities also identified as [cloud computing](https://www.janbasktraining.com/blog/what-is-cloud-computing/) stage. This new-fangled dominion of cloud computing is also recognized as IaaS, which means Infrastructure as a Service.

**Q5). What are the basic structures of the Amazon EC2 service?**

As the Amazon EC2 service is a cloud facility, so it has entirely all the cloud features. Amazon EC2 delivers the subsequent features:

* Virtual computing atmosphere (popular as instances)
* Pre-configured patterns
* Amazon Machine Images

**Q6). Define regions and availability zones in Amazon EC2.**

Being such a mammoth in the business, usually, information that Amazon EC2 uses is facilitated in various areas over the world. These overall areas are ordered as far as accessibility zones as well as regions

**Q7). What is Amazon EC2 Root Device Volume?**

When you dispatch an instance, the root device volume has the picture that was utilized to boot up the case in any case.

**Q8). What are the main components of AWS?**

Below mentioned are the key components of AWS:

* **Route 53**: A DNS web facility
* **Easy E-mail Facility**: It permits the transfer of e-mail using RESTFUL API demand or through consistent SMTP
* **Self and Access Organization**: It offers improved security and uniqueness management for your AWS account
* **Simple Storage Device known as S3**: It is a storing device and the greatest extensively used AWS service
* **Elastic Compute Cloud is known as EC2**: It offers on-demand computing properties for hosting requests. It is very valuable in case of random workloads
* **Elastic Block Store known as EBS**: It delivers determined storage volumes that assign to EC2 to permit you to continue data past the lifetime of a single EC2
* **CloudWatch:** To screen AWS possessions, it permits administrators to assess and gather key. Similarly, one can set an announcement alarm in case of an issue

**Q9). Explain in detail the function of Amazon Machine Image (AMI)?**

An Amazon Machine Image AMI is a pattern that comprises a software conformation (for instance, an operating system, a request server, and applications). From an AMI, we present an example, which is a duplicate of the AMI successively as a virtual server in the cloud. We can even offer plentiful examples of an AMI.

**Q10). What is the connection between Instance and AMI?**

We can launch diverse types of occurrences from a lone AMI. An example type basically controls the hardware of the host processor used for your example. Each occurrence type offers dissimilar calculate and memory competences. After we introduce an instance, it looks like an old-style host, and we can interrelate with it as we would do with any mainframe. We have comprehensive control of our examples; we can make usage pseudo to run instructions that need root rights.

**Q11). Describe storage for Amazon EC2 occurrence.**

Amazon EC2 offers numerous data storage choices for your occurrences. Each choice has an exclusive mixture of presentation and sturdiness. These storages can be used self-sufficiently or in grouping to suit your necessities.

There are chiefly four types of storage offered by AWS.

* Amazon EBS
* Amazon EC2 Instance store
* Amazon S3
* Addition Storgae

**Q12). How would you safeguard your EC2 instances while running it in a VPC?**

Security Groups can be utilized to safeguard your EC2 instances in a VPC. We can arrange both INBOUND and OUTBOUND movement in a Security Group which empowers anchored access to your EC2 occurrences.

**Q13). How many EC2 instances can you use in a VPC?**

You are limited to 20 EC2. However, the maximum VPC size is 65,536 instances.

**Q14). How will you monitor the network traffic in your AWS VPC?**

We can do it by using Amazon VPC Flow-Logs feature that is available in your VPC itself.

**Q15). What is the total number of buckets that can be created in AWS by default?**

100 buckets can be made in every one of the AWS accounts. If extra buckets are required then you can increment the bucket limit by presenting a service limit increase.

**Q16). What would you suggest should be the instance's tenancy attribute for running it on single-tenant hardware in AWS environment?**

The instance tenancy attribute must be set to a devoted case and different types of values probably won't be fitting for this activity.

**Q17). What parameters will you take into consideration when choosing the availability zone?**

Execution, valuing, idleness, and reaction time are some of the variables to think about while choosing the accessibility zone in AWS.

**Q18). If I’m using Amazon CloudFront, can I use Direct Connect to transfer objects from my own data-center?**

Yes. Amazon CloudFront bolsters custom inceptions including starting points from outside of AWS. With AWS Direct Connect, you will be accused of the separate information exchange rates.

**Q19). Imagine that you are launching an instance under the free usage tier from AMI having a snapshot size of 50GB. How are you going to launch the instance under the free usage tier?**

It is not possible to launch this particular instance under the free usage tier.

**Q20). Name the AWS service exists only to superfluously cache data and images?**

AWS Edge locations are the AWS services which superfluously cache data and images.

**Q21). What is Geo Restriction in CloudFront?**

A Geo-restriction feature causes you to keep clients of explicit geographic areas from getting to content which you're conveying through a CloudFront web circulation.

**Q22). What is Amazon EMR?**

EMR is a survived cluster stage that encourages you to translate the working of information structures before the implication. [Apache Hadoop and Apache Spark](https://www.janbasktraining.com/blog/spark-vs-hadoop/) on the Amazon Web Services causes you to research a lot of information. You can get ready information for the exam objectives and showcasing insightfulness outstanding tasks at hand utilizing [Apache Hive](https://www.janbasktraining.com/blog/hive-data-models/) and utilizing other applicable open source plans.

**AWS Interview Questions for Intermediate Level Jobs**

**Q23). What is multi-AZ RDS?**

Multi-AZ (Availability Zone) RDS enables you to have a copy of your generation database in another accessibility zone. Multi-AZ (Availability Zone) database is utilized for calamity recuperation. You will have a precise of your database. So when your essential database goes down, your application will consequently failover to the backup database.

**Q24). What are security groups?**

Security groups go about as a firewall that contains the traffic for at least one examples. You can relate at least one security gatherings to your occasions when you dispatch at that point. You can add guidelines to every security bunch that enables traffic to and from its related examples. You can alter the guidelines of a security bunch whenever the new standards are naturally and promptly connected to every one of the occasions that are related to the security group.

**Q25). What Is Configuration Management?**

Configuration management has been around for quite a while in web tasks and frameworks organization. However, its social ubiquity has been constrained. Most frameworks head design machines as programming were created before adaptation control – that is physically making changes on servers. Every server can look at that point and for the most part, is somewhat extraordinary. Investigating, however, is clear as you log in to the crate and work on it legitimately. Setup the executives brings a huge robotization instrument in the image, overseeing servers like strings of a manikin. This powers institutionalization, best practices, and reproducibility as all configs are formed and oversaw. It likewise presents another method for working, which is the greatest obstacle to its reception.

**Q26). Explain How You Would Simulate Perimeter Security Using The Amazon Web Services Model?**

Traditional perimeter security that we're now acquainted with utilizing firewalls etc. isn't upheld in the Amazon EC2 world. AWS underpins security gatherings. One can make a security bunch for a hop box with ssh gets to – just port 22 open. From that point, a web server gathering and database bunch are made. The web server bunch permits 80 and 443 from the world, yet port 22 \*only\* from the hop box gathering.

Further, the database bunch permits port 3306 from the web server gathering and port 22 from the hop box gathering. Add any machines to the web server gathering, and they would all be able to hit the database. Nobody from the world can, and nobody can straightforwardly ssh to any of your cases.

**Q27). How to Use Amazon Sqs?**

Amazon SQS (Simple Queue Service) is a message passing system that is utilized for correspondence between various connectors that are associated with one another. It likewise goes about as a communicator between different segments of Amazon. It keeps all the distinctive utilitarian segments together. This usefulness causes various parts to be inexactly coupled, and give engineering that is more failure resilient system.

**Q28). What do you mean by classic link?**

The Amazon virtual private cloud classic link will allow EC2 examples in the EC2 great stage. This happens so it can speak with the occasions that are available in the virtual private cloud. The correspondence happens with the assistance of private IP addresses. To utilize a great connection, it is significant that you empower it to for virtual private cloud in your record. At that point, you should relate a security bunch with a case in the EC2 great. This security bunch is from the VPC for which you empowered the great connection in your record. Every single principle that is there for the VPC security bunch is relevant for the correspondences between the examples in EC2 exemplary and those cases in the VPC.

**Q29). What is AWS Lambada?**

Lambda is an event-driven stage. It is a process benefit that runs code in light of occasions and consequently deals with the computer assets required by that code

**Q30). If my AWS Direct Connect flops, will I lose my connection?**

If a gridlock AWS Direct connects has been arranged, in the occasion of a let-down it will change over to the second one. It is optional to permit Bidirectional Forwarding Detection (BFD) when arranging your influences to safeguard faster recognition and failover. On the other hand, if you have organized a backup IPsec VPN joining as an alternative, all VPC traffic will failover to the backup VPN connection routinely.

**Q31). Can I connect my corporate data center to the Amazon Cloud?**

Yes, you can do this by setting up a VPN(Virtual Private Network) association between your organization's system and your VPC (Virtual Private Cloud), this will enable you to collaborate with your EC2 occasions as though they were inside your current system.

**Q32). Describe Amazon Machine Image, and what is the connection between Instance and AMI?**

Amazon Web Services offers numerous ways to contact Amazon EC2, like the web-based border, [AWS Command Line Interface](https://www.janbasktraining.com/blog/install-aws-command-line-interface/) CLI as well as Amazon Tools for Windows Power Shell. Initially, you are required to sign up for an AWS version, and you can contact Amazon EC2. Amazon EC2 offers a Query API. These requirements are HTTP or HTTPS requirements that practice the HTTP verbs GET or POST and a Query constraint called Action.

**Q33). What are two types of AMIs or Amazon Machine Images?**

There are two kinds of AMIs or Amazon Machine Images that are accessible:

* EBS based storage
* Instance store-backed AMI

**Q34). Are you aware of the Security Group in Amazon EC2? Explain a little bit about it.**

Security groups in Amazon EC2 are one of the routes through which the security of the cloud organize is ensured. They go about as a firewall and are utilized for controlling both the inbound just as outbound traffic at the dimension of the instance.

**Q35). What are Amazon EBS-Optimized instances?**

Amazon EBS streamlined occasions to guarantee that the Amazon EC2 case is set up to exploit the I/O of the Amazon EBS Volume. An Amazon EBS-improved occasion utilizes a streamlined setup stack and gives the extra devoted ability to Amazon EBS I/When you select Amazon EBS-upgraded for a case you pay an extra hourly charge for that instance.

**Q36). What Is Lambda@edge In Aws?**

In AWS, we can utilize Lambda@Edge utility to take care of the issue of low system idleness for end clients. In Lambda@Edge, there is no compelling reason to the arrangement or oversee servers. We can simply transfer our Node.js code to [AWS Lambda](https://www.janbasktraining.com/blog/aws-lambda-tutorial/) and make works that will be activated on CloudFront demands. At the point when a solicitation for substance is gotten by CloudFront edge area, the Lambda code is prepared to execute. This is a generally excellent choice for scaling up the activities in CloudFront without overseeing servers.

**Q37). Which virtual network interface would you use to attach to an instance in a VPC?**

Elastic Network Interface

**Q38). Explain what T2 instances is?**

T2 instances are intended to give moderate gauge execution and the capacity to blast to higher execution as required by the outstanding task at hand.

**Q39). What is the role of a Route Table in AWS?**

Route Table is utilized to network the system pockets. By and a large one-course table would be accessible in each subnet. Course table can have any no. of records or data, subsequently appending different subnets to a course table is additionally conceivable.

**Q40). What is the use of AWS CloudTrail?**

CloudTrail is intended for logging and following API calls. It is also used to review all the S3 bucket accesses.

**Q41). Are there any Bandwidth constraints for internet gateways?**

Ordinarily, an IG is horizontally called, and it is Redundant and Highly Available. It isn’t having any type of Bandwidth constraints as a rule.

**Q42). Which instance will you use for deploying a 4-node Hadoop cluster in AWS?**

We can utilize a c4.8x large instance or i2. large for this, yet utilizing a c4.8x will require a superior configuration on PC.

**Q43). How can you bind a user session with the specific instance in ELB (Elastic Load Balancer)?**

This can be easily achieved by permitting Sticky Session.

**Q44). What will happen if you erase a peering connection in your side?**

The peering connection accessible in the opposite side would likewise get erased. There will be no more activity streaming.

**Q45). What is a redshift?**

Redshift is a major information distribution center item. It is quick and incredible, completely overseen information distribution center administration in the cloud.

**Q46). What are the edge locations?**

An edge location is where the substance will be stored. Along these lines, when a client is attempting to getting to any substance, the substance will consequently be looked in the edge location.

**AWS Interview Questions and Answers for Advanced Workforce**

**Q47). What is a key pair, and what are its uses?**

You utilize Key Pair to log in to your Instance in an anchored way. You can make a key pair utilizing EC2 support. At the point when your occurrences are spread crosswise over locales, you have to make the key pair in every region.

**Q48). Describe what S3 is?**

S3 is known for Simple Storage Service. You can custom the S3 interface to supply and recover any quantity of data, at any time and from any place on the web. For S3, the expense model is "pay as you go."

**Q49). Will you use encryption for S3?**

It is smarter to consider encryption for delicate information on S3 as it is a restrictive innovation.

**Q50). How can you send a request to Amazon S3?**

We can do that by utilizing the REST API or the AWS SDK wrapper libraries which wrap the basic Amazon S3 REST API.

**Q51). What are the parameters for S3 pricing?**

The pricing model for S3 is as below-

* Storage used
* Number of requests you make
* Storage management
* Data transfer
* Transfer acceleration

**Q52). What is the pre-requisite to work with Cross region replication in S3?**

You have to empower forming on both source container and goal to work with cross-district replication. Additionally, both the source and destination bucket ought to be in a different region.

**Q53). Can S3 be cast-off with EC2 instances, in case of “Yes” please specify How?**

Yes, it can be cast-off for instances with root approaches backed by native occurrence storage. By using Amazon S3, developers have access to the similar extremely scalable, dependable, fast, low-priced data storage substructure that Amazon uses to track its own worldwide network of websites. To perform systems in the Amazon EC2 atmosphere, developers use the tools providing to load their Amazon Machine Images (AMIs) into Amazon S3 and to transfer them between Amazon S3 and Amazon EC2. An additional use case might be for websites hosted on EC2 to load their stationary content from S3.

**Q54). Where do you think an AMI fits, when you are designing an architecture for a solution?**

AMIs(Amazon Machine Images) resemble formats of virtual machines, and an instance is derived from an AMI. AWS offers pre-built AMIs which you can pick while you are propelling a case, some AMIs are not free,like this can be purchased from the AWS Marketplace. You can likewise make your own custom AMI which would enable you to spare space on AWS. For instance, on the off chance that you needn't bother with a lot of programming on your establishment, you can modify your AMI to do that. This makes it cost effective since you are evacuating the undesirable things.

**Q55). What is the purpose of Subnets?**

When a system has a greater number of hosts, dealing with these hosts can be very tasking under an extensive solitary system. Subsequently, we partition this huge system into effortless small sub-systems (subnets) with the goal that the tasks of management under each subnet winds up being less demanding.

**Q56). What are the roles?**

Roles are utilized to give authorizations to elements that you trust inside your [AWS account](https://www.janbasktraining.com/blog/create-an-aws-account/). Roles are clients in another record. Roles are like clients; however, with Roles you don't have to make any username and password to work with the assets.

**Q57). Which instance has an hourly rate with no long-term commitment?**

On-Demand Instance has an hourly rate with no long-term responsibility because the estimating of this element fluctuates with the valuing model, for example just as a zone.

**Q58). Which operation retrieves the newest version of the object?**

GET operation helps you to retrieve the newest version of the object.

**Q59). Does Clustering need to be turned on to use GSLB?**

Yes, you should turn on grouping and furthermore design it to utilize Global Server Load Balancing. Every single intermediary that goes in close vicinity to the site or group must gain a similar design. In this way, every bit of hardware can go about as a DNS server if that turns into the master for the site. Every one of the destinations will have a special SLB/GSLB/Cluster design, and you should utilize the GSLB site flood order with the goal that the remote GSLB site can be added to the nearby machine.

**Q60). Suggest the possible connection issues that you may encounter when connecting to an EC2 instance?**

* Unprotected private key file
* Server refused key
* Connection timed out
* No supported authentication method available
* Host key not found, permission denied.
* User key not recognized by the server, permission denied.

**Q61). Are you allowed to run multiple websites on an EC2 server while using a single IP address?**

Yes, but to do that more than one elastic IP is required.

**Q62). Explain what happens when you reboot a running EC2 instance?**

Rebooting a running [EC2 instance](https://www.janbasktraining.com/blog/create-amazon-ec2-instance/) is just similar to rebooting a PC. You will not return to the image’s original state, but, the contents of your hard disk are going to remain the same.

**Q63). What is a snowball?**

Snowball is an information transport arrangement that utilized source machines to exchange a lot of information into and out of AWS. Utilizing snowball, you can move colossal measure of information starting with one spot then onto the next, which lessens your system costs, long exchange times and furthermore gives better security.

**Q64). What is the process to speed up data transfer in Snowball?**

The data transfer can speed up in the following way:

* By playing out numerous duplicate tasks at one time, for example, on the off chance that the workstation is sufficiently incredible, you can start various cp directions each from various terminals, on a similar Snowball gadget.
* Copying from different workstations to a similar snowball.
* Transferring enormous records or by making a bunch of little document, this will decrease the encryption overhead.
* Eliminating pointless snaps, for example, make a setup where the source machine(s) and the snowball are the main machines dynamic on the switch being utilized, this can enormously improve execution.

**Q65). Mention the work of an Amazon VPC router?**

Empowering of Amazon EC2 cases that is inside the subnet so it can speak with [Amazon EC2](https://www.janbasktraining.com/blog/change-instance-aws-ec2-type/) occurrences on different subnets that are in the equivalent VPC is finished by an Amazon VPC switch. It likewise helps in empowering Internet portals, subnets, and virtual private passages so it can speak with one another. You won't get between utilization information from the switch. Be that as it may, you are qualified to get arrange utilization measurements from the cases which are utilizing Amazon cloud watch.

**Q66). Mention the process in which a hardware VPN connection turns work with Amazon VPC?**

The virtual private cloud is associated with the server farm with the assistance of an equipment VPN association. Web convention security VPN associations are upheld by Amazon. To assistant the uprightness and privacy of any information which is in travel, this information is exchanged between the VPN and the server farms are directed over a scrambled VPN association. To set up an equipment VPN association, you needn't bother with the accessibility of an Internet passage.

**Q67). Explain the AWS Certificate Manager?**

AWS Certificate Manager, which can be abbreviated as ACM deals with the unpredictability of broadening, giving and controlling the endorsements, which are conceded over ACM to the client's AWS based forms and websites.

Individuals deal with ACM to keep up and appeal the endorsements and practice other Amazon web administrations for the site's motivation. ACM authentications can't be dealt with outside of AWS.

**Q68). What are the important features of Amazon cloud search?**

Important features of the Amazon cloud are:

* Boolean searches
* Prefix Searches
* Range searches
* Entire text search
* AutoComplete advice

**Q69). What are key-pairs in AWS?**

Key – pairs are secure login data for your virtual machines. To associate with the occurrences, you can utilize key-sets which contain a public-key and private-key.

**Q70). How to Disable Password-based Logins for Root in Amazon Ec2 Instance?**

Utilizing a fixed root secret key for an open AMI is a security chance that can rapidly become known. Not with standing depending on clients to change the password after the first login opens a lucky little opening for potential maltreatment.

#### **1. Define Amazon Web Services or AWS.**

Answer: This is one of the most basic AWS interview questions and can be answered in both simple and complex structures, depending on the interviewer.

According to the terminology, AWS or Amazon Web Services is defined as a platform which is designed to provide secure cloud services, computing power to clients, database storage options, content delivery and many other services which are all intended towards business development and growth.

#### **2. List out the main components of AWS.**

Answer: Similar to other Cloud Services in the industry, AWS too has been designed in a structured manner and has several key components. Mentioned below is the list of the same:

**Amazon Route 53:** This is a DNS (Domain Name Service) web service.

**Easy Email Service:** This service allows customers and clients to address email utilization through normal SMTP or RESTFUL API.

**Access Management and Identity:** This has been designed in order to provide heightened identity control and protection for a client’s AWS account.

**S3 or Simple Storage Device:** It is a very well-known utility among all the AWS Services and is mainly used in warehouse equipment.

**EC2 or Elastic Compute Cloud:**This is a utility designed to manage variable workloads and gives clients the ability to afford on-demand computing sources for hosting.

**EBS or Elastic Block Store:**This particular utility is used to expand beyond EC2 and is designed to connect EC2 to enable the lifespan of data beyond the capacities of EC2.

**Cloud Watch:** This is mainly a crisis management utility and is designed to help managers inspect and obtain additional resources in the light of a crisis.

#### **3. What do you know about Buffer in AWS?**

Answer: A buffer is necessary in any cloud computing technology in order to maintain seamless integration across a huge flow of traffic and loads. The Elastic Load Balancer in Amazon Web Services has been designed in a way to ensure that all the incoming traffic is optimally distributed across all channels of AWS instances.

The presence of a buffer enables the components to work in an unstable situation and receive and process requests as it gets them. Essentially the presence of a buffer is needed to create an equilibrium between all the apparatus and provide them with an identical ability to supply more rapid services.

#### **4. How can you secure your data in the cloud?**

Answer: One of the most important aspects of cloud computing is its security. It must be ensured at all times that no individual or organization is able to seize the data of a client while in a transition from one point to another and also there shouldn’t be any leakage of information from any of the several storerooms in the cloud. Thus one of the most effective ways of securing information is by segregating it and then encrypting the same by one of the mutually agreed options.

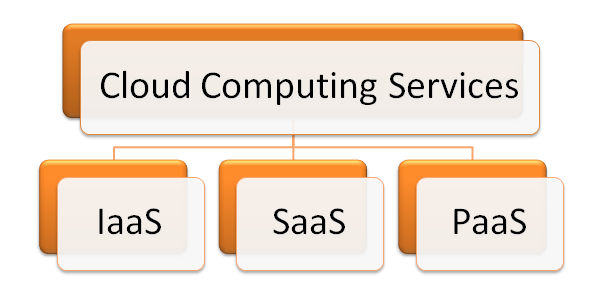
#### **5. List out the different services offered by cloud computing.**

Answer: There have been a number of public and private cloud platforms developed these days. All of these are composed of several services/layers of cloud computing. Mentioned below is a list of the same:

**PaaS:** It is the acronym for Platform as a Service.

**IaaS:** It is the acronym for Infrastructure as a Service.

**SaaS:** It is the acronym for Software as a Service.



#### **6. Can Amazon Instance be vertically scaled? If yes, how?**

Answer: Yes, it is very much possible to vertically scale an Amazon Instance. Here’s how:

* 1. Form and twist a fresh massive instance on top of the currently governing instance.
  2. Make an attempt to delay the current instance and separate the source web mass of dispatch and server.
  3. The next step is to quit your existing instance and separate the same from source quantity.
  4. Take note of the new machine ID and connect the same source mass to your fresh server.
  5. Make it a point to study AWS Training Online from Real Time Experts.

#### **7. Name the basic components of Amazon Web Services.**

Answer: Amazon Web Services or AWS consists of 4 main components that are as listed below:

**Amazon S3:** This component has been designed to enable one to retrieve information which has been occupied in creating the cloud structural design and also retrieve the produced information as a consequence of the specified key.

**Amazon EC2 instance:** This component has been designed in order to run automatic parallelization and also achieve job scheduling. This instance is immensely helpful in running a large distributed system on the Hadoop Cluster.

**Amazon SimpleDB:**This component helps in the storage of the transitional positional log and also run the errands when they are executed by the client or the consumer.

**Amazon SQS:** This component has been mainly designed to act as a mediator between different controllers. This is an additional cushioning for the managers at Amazon.

Also Read: [AWS Solutions Architect Interview Questions](https://www.whizlabs.com/blog/aws-solution-architect-interview-questions/)

## **AWS EC2 Interview Questions**

This section has been designed to contribute some important AWS interview questions based on EC2 instance. This section comprises the important part of the blog best AWS interview questions and answers. Mentioned below are 7 most common AWS Interview Questions based on EC2.

#### **8. Define Amazon EC2.**

Answer: This is one of the most basic and frequently asked EC2 based Amazon AWS interview questions and can be explained in very simple terms.

[Amazon EC2](https://www.whizlabs.com/blog/aws-csaa-ec2/) service is the acronym for Amazon Elastic Compute Cloud which has been designed to provide its customers with resizable and scalable computing capacity when they are using the cloud. Using the service of Amazon EC2, a client is able to launch as many virtual servers as he wants. In each of these virtual servers, the client is able to manage storage as well as configure security as and when needed. The main advantage of using Amazon EC2 is its ability to get everything done with minimal friction at all times.

#### **9. List out all the best security practices for AWS EC2.**

Answer: As a client who is using the service of Amazon EC2, there are some security best practices that needs to be followed at all times. The same is as outlined below.

* + Use the AWS identity and access management to control and limit access to all your AWS resources at all times.
  + You should only allow trusted networks and hosts to have access to all ports to the instance.
  + Regularly review all the groups on your security schedule regularly.
  + Only allow permission to the ports that are utmost required.
  + One of the most important security measures that need to be taken is to disable the password-based login, as this is often the point of most security compromise.

Check out:[AWS EC2 Study Notes](https://www.whizlabs.com/blog/aws-csaa-ec2/)

#### **10. Explain Stopping, Starting, and Terminating an Amazon EC2 instance.**

Answer: Stopping and Starting an instance are the most common commands used on the Amazon EC2 platform. Questions based on these commands are considered one of the best AWS interview questions. Mentioned below is the explanation of the commands.

Once the command for stopping an instance is issued, the instance first performs a normal shutdown and then transitions itself to a stopped state. All the Amazon EBS volumes remained attached as they were, and you can resume the instance at a later stage. One of the main advantages of this feature is that Amazon doesn’t charge you additionally for the hours while the instance was in a stopped state.

When you issue the termination command to an instance, the instance first performs a normal shutdown and then moves ahead with detaching the existing Amazon EBS volumes. This can only be achieved if the deleteOnTermination attribute is set to false in the Amazon EBS settings. Once terminated, the client cannot resume the instance at a later stage.

#### **11. Can S3 be cast-off with EC2 Instances, If yes specify how?**

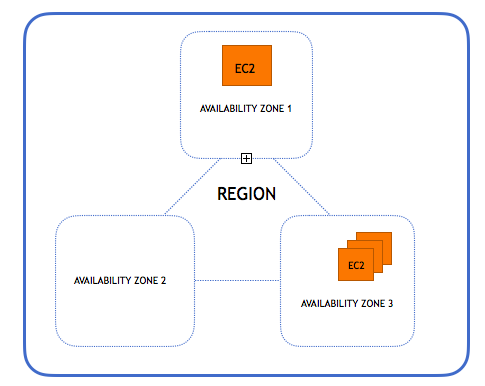
Answer: Yes, it is possible to cast off with EC2 instances by using root approaches which have the backup of native occurrence storage. When a developer or a client is using Amazon S3 services, they have the capability to use extremely scalable and additionally fast, dependable, low priced data storage structures that are used by Amazon itself to track the worldwide network of its own websites.

However, in order to perform these operations in the Amazon EC2 atmosphere, developers need to use certain tools in order to load their Amazon Machine Images (AMIs) into Amazon S3 and then transfer them back to Amazon EC2. The additional use of this method might be when developers need to load stationary content into S3 from their websites hosted on Amazon EC2.

#### **12. Define regions and availability zones in Amazon EC2.**

Answer: Being such a mammoth in the industry, it is common knowledge that Amazon EC2 will be hosted in multiple locations across the world. These worldwide locations are categorized in terms of availability zones as well as regions.

Each of these regions is completely independent of the other and each availability zone is isolated as well. But all the availability zones in a particular region are interconnected through multiple low latency links.



#### **13. What is Amazon EC2 Root Device Volume?**

Answer: When you as a developer launch an instance, the root device volume has the image that was used to boot up the instance in the first place.

There are two types of AMIs or Amazon Machine Images that are available:

* 1. EBS based storage, and
  2. Instance store-backed AMI

#### **14. Are you aware of Security Group in Amazon EC2? Tell something about it.**

Answer: Security groups in Amazon EC2 are one of the ways through which the security of the cloud network is protected. They act as a firewall and are used for controlling both the inbound as well as outbound traffic at the level of the instance.

Also Read: [Top 30 AWS Cloud Support Engineer Interview Questions](https://www.whizlabs.com/blog/aws-cloud-support-engineer-interview-questions/)

### AWS S3 Interview Questions

This section covers [AWS S3](https://www.whizlabs.com/blog/aws-s3/) based AWS interview questions for the aspiring candidates going for an Amazon interview. Read on to find out the top AWS interview questions based on S3 that you may come across in the interview.

#### **15. Which of the following is a method for bidding on unused EC2 capacity based on the current spot price?**

Answer: Spot Instance is the best method for bidding on unused EC2 capacity since this feature requires an affordable low price and the availability of the system varies depending on the availability of excess capacity.

#### **16. Is this statement wrong, why?**

#### **“The standard instances are not suitable for standard server applications”**

Answer: Yes, the statement is wrong because the standard instances are deemed suitable only for standard server applications.

#### **17. Which instance has an hourly rate with no long-term commitment?**

Answer: On-Demand Instance has an hourly rate with no long-term commitment because the pricing of this feature varies with the pricing model, instance as well as zone.

#### **18. Which Amazon cloud-based storage system allows you to store data objects ranging in size from 1 byte up to 5GB?**

Answer: Amazon S3 cloud-based storage system allows you to store data objects ranging in size from 1 byte up to 5GB. It is because, in S3 containers, storage containers are often referred to as buckets.

#### **19. Which operation retrieves the newest version of the object?**

Answer: GET operation retrieves the newest version of the object since the versioning can also be used for archiving purposes as well as preserving data.

#### **20.  How can the request be sent to Amazon S3?**

**Answer:**As we all know that Amazon S3 is a rest service. The request can be sent either by using the REST API or using AWS SDK wrapper libraries which can be used to wrap the Amazon S3 REST API.

Also Read: [How to secure files in Amazon S3?](https://www.whizlabs.com/blog/aws-s3-data-security/)

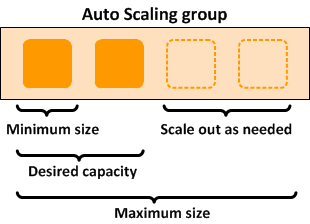
## **AWS Autoscaling and Load Balancer Interview Questions**

Autoscaling and load balancer are the important features of AWS services and the interviewer may ask many of the AWS interview questions based on these features in the interview. These important topics can’t be ignored, so here we cover AWS interview questions based on Autoscaling and load balancer. Let’s read out.

#### **21. What is auto-scaling and how does it work?**

Answer: Auto-scaling is one of the most important features that Amazon Web Service provides that gives you an allowance to configure and automatically stipulate and also twists new instances without even your intervention. This can be done by setting the edges and measurements to screen.

At the point when those edges have crossed another instance based on your preference will be spun up, rolled, and configured into the load balancer pool. Now, you would’ve scaled that horizontally without the intervention of an operator.



#### **22. What is Server Load Balancing?**

Answer: SLB (Server Load Balancing) provides the performance of the network and also it delivers the content by the implementation of a series of priorities as well as algorithms which helps in responding to the precise requests that are made to the network. In other words Server Load Balancing (SLB) takes the part of distributing the clients to a vast group of some servers and that also ensures that the clients which are sent are only sent to the specific servers and not to the failed servers.

#### **23. What is Global Server Load Balancing (GSLB) and does Clustering need to be turned on in order to use GSLB?**

Answer: GSLB (Global Server Load Balancing) is very much similar to SLB (Server Load Balancing) but GSLB takes SLB to a global scale. It authenticates us to stack balance VIPs from various geographical locations as well as a single entity. From this, the geographic site gets scalability and fault tolerance.

Yes, you must turn on clustering and also configure it in order to use Global Server Load Balancing. Each and every proxy that comes within the site or cluster must acquire the same configuration. So, every piece of equipment can act as a DNS server if that becomes the master for the site. Each of the sites will be having a unique SLB/GSLB/Cluster configuration, and you will have to use the GSLB site overflow command so that the remote GSLB site can be added to the local appliance.

#### **24.  What are the automation tools that can be used to spin up the servers?**

**Answer:** The use of AWS API is the most prominent way to roll your own scripts. The scripts like this can be written in any language of one’s choice like bash or python. Another option is that we can use configuration management and also provisioning the tool like its puppet or it can be better when the successor Opcode Chef can be used.

There is one more prominent option which is Ansible because the need of an agent is not required, and also the shell scripts can run as it is. The Cloudformation and Terraform are the things which you might look towards and in the end, the whole infrastructure can be captured by the resulting code, and all of this can be checked in the git repository.

#### **25. What are those load balancing methods which are supported with array network GSLB and also explain Reverse Proxy Cache?**

**Answer:** The following methods of Global Server Load Balancing are supported by Array appliance.

1. **Overflow:** Overflow method allows all the requests to be sent to the different remote site when the local site id loaded up to 80%
2. **lc:** “lc” here stands for Least Connections, it sends the clients to the site which has the least count of current connections.
3. **rr:** “rr” here stands for Round Robin, it sends the clients in the round robin suction to each site.

Reverse Proxy Cache is a cache that is presented In the front of the origin servers. That’s the reason for using the reverse term in the name. If a request of the cached object is made by the client then the request will be served from the cache and not from the origin server by the proxy.

#### **26. What are the challenges in microservices debugging and troubleshooting?**

**Answer:**In the serverless world, debugging and troubleshooting is the most difficult process. The log error and warning messages are logged in CloudWatch. This is the area that needs attention and Amazon is working on it.

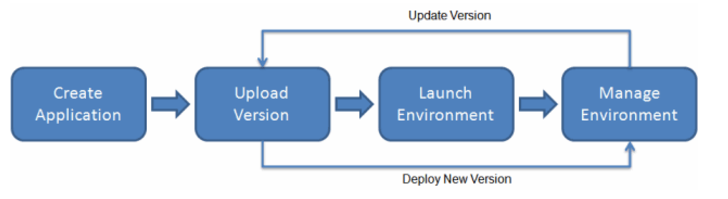
Also Read: [Top 20 AWS VPC Interview Questions](https://www.whizlabs.com/blog/aws-vpc-interview-questions/)

## **AWS Elastic Beanstalk Interview Questions**

Whether you are a beginner or have gained some experience in AWS, you may be asked one or more Elastic Beanstalk based AWS interview questions in the interview. So, this section is focused on the best AWS interview questions based on Elastic Beanstalk. Keep the reading on to get an answer to the top AWS interview questions.

#### **27. What is Elastic Beanstalk?**

**Answer:**Elastic Beanstalk provides the basic services which help in the creation of Environment. It also provides services like managing the application environments which include the creation of logs, health, and monitoring, etc.



#### **28. Mention few benefits of the elastic beanstalk.**

**Answer:**The Beanstalk is easy for beginners and most flexible. Deployment of the application on AWS is easy. Various tools like Visual Studio are used to upload the applications. The deployment details of capacity monitoring and auto-scaling can be easily managed by AWS Beanstalk.

**Demand Scaling**: The application can be auto-scaled which helps in the handling of workload or traffic while minimizing the cost for the application.

**Control over Tools:**Tools and resources like Amazon EC2 instance type could be easily controlled.

**Best productivity and security features**: Security and configuration of servers, management of the database, firewalls are some features provided by AWS EBS.

#### **29. Mention some of the advantages of AWS Elastic Beanstalk.**

**Answer:**Some of the benefits of AWS EBS are as follows:

* EBS is economical with no hidden costs. You will pay what you will use.
* The AWS management console can be accessed within an hour with its fast access.
* IT supports languages like Java, .NET, PHP, Node.js, Python, Ruby, etc.
* AWS EBS builds the setup and spectators the AWS service for the creation of web services.

[](https://www.whizlabs.com/aws-certified-cloud-practitioner/online-course/)

#### **30. Mention some of the advantages of AWS Elastic Beanstalk.**

**Answer:**Some of the demerits of using AWS Beanstalk are:

* If there is a deployment failure then no notification is shown. So further steps also are full of deployment failures.
* If you terminate the instance or recover the EBS, it won’t work.
* There is no information on new stack update though it updates itself regularly.
* For just two front-end server deployment process can take up to 15 minutes also.

#### **31. What are the operating systems used by Elastic Beanstalk?**

**Answer:**AWS Beanstalk requires a stable, high-performance, secure environment for execution for Amazon EC2 cloud computing. So there are two EMI’s which are maintained by AWS. Amazon Linux AMI and Windows Server 2012 R2 AMI are two OS which runs Amazon Elastic Beanstalk.

#### **32. How to make any application private?**

**Answer:**In myapp.elasticbeanstalk.com the application is public by default. Amazon VPC should be used to make the virtual network private. Specific security group rules are also there to make the application private.

Also Read: [Top AWS Database Interview Questions](https://www.whizlabs.com/blog/aws-database-interview-questions/)

## **AWS Lambda Interview Questions**

Designed in a way to run applications in a serverless computing platform, AWS Lambda is one of the most unique offerings of AWS. Lambda-based AWS interview questions constitute the main part of the lastest AWS interview questions. So, we cover this section to help you go through the AWS interview.

#### **33. What do you mean by AWS Lambda?**

**Answer:**If you talk about a serverless compute service then AWS Lambda offers the best service. The codes can be run and managed without managing servers. You just pay for the consumption of data in computing. When you are idle you do not have to pay anything. Just an upload of code is needed and rest is managed by Lambda.

#### **34. Mention the time span in which the AWS Lambda function will execute.**

**Answer:**All the process of AWS Lambda and execution takes place within 300 seconds from placing calls to AWS Lambda. The default timeout is 3 seconds rest you can setup any value between 1 to 300 seconds.

#### **35. Can Lambda be vertically scaled? If yes, how?**

**Answer:**This is one of the most prominent features of AWS Lambda. When a larger instance is to be spin then we use vertical scaling. If there is scaling in use then it has to be paused and has to be detached from the server. The ID of new device post is to be noted down to continue the process.

#### **36. Mention the role of SQS in Lambda.**

**Answer:**There is a certain approach which is used for sharing of information and passing that information among different hosts and connectors and communication can be established. The functional components could be connected even if they are different. There are many advantages of using SQS and several of the failures are eliminated.

#### **37. What are the Final variables?**

**Answer:**Once assigned these variables cannot be changed. In its earlier stage, they are known as effective variables where any form of change is possible and the values are assigned to them. They also play an important role in testing. Most of the local expressions are final.

#### **38. How can performance be improved in Lambda?**

**Answer:**There are some of the methods by which performance can be improved in Lambda. You can improve the performance by using Linux software RAID and with the help of RAID, we can be assured of better security.

[](https://www.whizlabs.com/aws-sysops-administrator-associate/online-course/)

## **AWS Developer Interview Questions and Answers**

If you are going for the interview of AWS developer role, you may come across AWS interview questions belonging to different AWS services and their features. So, this section is focused on AWS interview questions for the developer. Go through the below mentioned AWS interview questions to ace the AWS developer interview.

#### **39. Define Automate Deployment.**

Answer: This method is similar in many ways to programming in other languages. However, the unique advantages of this platform is that it helps in cutting down a lot of challenges. One of the best things is, the deployment can be made as one becomes more proficient with other offerings of the service. Using Automated deployment clients can minimize human interference and also ensure that the outcomes are quality based in every aspect.

#### **40. List out the different ways to access EC2.**

Answer: EC2 can be accessed both via web-based Interface and also Command Line Interface. Additionally, there are Powershell tools available in Windows which can be simply executed.

#### **41. What are the advantages of using the serverless approach?**

Answer: Using the serverless approach has multiple advantages. Mentioned below is a list of the same:

* + The approach is utterly simple which converts to quicker time to market and thus higher sales.
  + Clients are only required to pay when the code is in operation, thus a huge amount of money can be saved in enhanced profits.
  + Clients do not need any additional infrastructure in order to run this application.
  + Clients do not need to give any second thought on the server which is running the code.

#### **42. Is it possible to debug and troubleshoot the small or microservices?**

Answer: Yes, it is very much possible to debug and troubleshoot small as well as microservices. The unique feature enables it to be done even when appropriate tasks are being performed in the background.

#### **43. Why is Lambda regarded as a time-saving approach?**

Answer: The main reasons due to which Lambda is considered as a time-saving approach are as follows:

* + All the data can be simply stored in the local server memory.
  + The data can be stored directly into the database without affecting their performance.
  + Integration testing is highly powerful and can be made through multiple vendors.

#### **44. What is your opinion About Zero Downtime Deployment?**

Answer: Deployments are most commonly considered in the form of functions. The advantageous feature of AWS Lambda is that it divides the functions into cases when they are hugely complex. The app in these scenarios remains offline during such a time period, but the end result is always great and of high quality.

Also Read: [Top 15 AWS Developer Interview Questions and Answers](https://www.whizlabs.com/blog/aws-developer-interview-questions/)

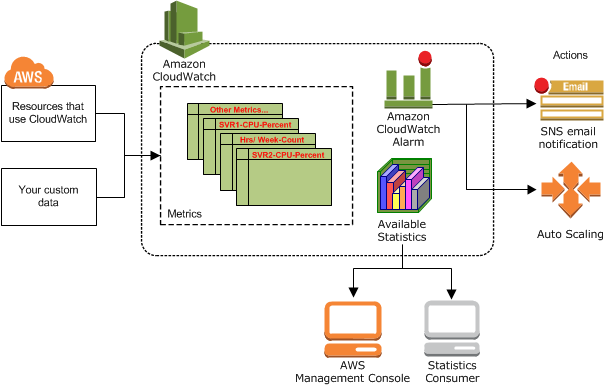
## **AWS CloudWatch Interview Questions**

Amazon CloudWatch is a part of the Amazon Web Services family and is a management tool which is developed for system architects, administrators as well as developers. In order to have your best shot at cracking an AWS interview, here are the most common AWS interview questions for AWS aspirants.

#### **45. Define Amazon Cloudwatch.**

Answer: As mentioned above, Amazon CloudWatch is a management tool and is a part of the Amazon Web Services family. It is basically a monitoring service for AWS cloud resources and all applications run on the AWS platform.

CloudWatch can be used to track and collect metrics, set alarms, collect and monitor log files, and also monitor resources such as EC2 instances, RDS DB instances, and DynamoDB tables.



#### **46. Name the operating systems on which CloudWatch runs.**

Answer: CloudWatch is a truly versatile system and it is capable of receiving and providing metrics for all EC2 instances and currently works on any operating system supported by EC2.

#### **47. What kinds of things can I do with CloudWatch logs?**

Answer: As CloudWatch is capable of storing and monitoring a client’s logs and help them better understand how their systems and applications are operating.

CloudWatch can be used to log in multiple ways, which are as mentioned below:

* 1. Long-term log retention
  2. Real-Time application and system monitoring

#### **48. Which platforms support CloudWatch Logs Agent?**

Answer: The CloudWatch logs agent is supported by a number of operating systems and platforms. The list of the same is as mentioned below:

* 1. CentOS
  2. Amazon Linux
  3. Ubuntu
  4. Red Hat Enterprise Linux
  5. Windows

#### **49. Does the CloudWatch logs agent support IAM roles?**

Answer: Yes, the CloudWatch logs agent is very much capable of supporting and integrating with IAM and has access to both keys and IAM roles.

#### **50. List out the retention period of all metrics.**

Answer: CloudWatch retains all its metrics accordingly as mentioned in the table below.

* + Any data points or high-resolution custom metrics with a span of fewer than 60 seconds are available for 3 hours.
  + Data points with a period of 60 seconds are available for 15 days.
  + Data points with a period of 5 minutes are available for 63 days.
  + Data points with a period of 1 hour are available for 455 days or 15 months.

## **AWS Lambda Interview Questions**

### [1.   Do the AWS Lambda-based functions stay available when code or its configuration is changed?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled1)

Yes. When a Lambda function is updated, there shall be a brief period, less than a minute, when requests can be served by either the old or the new version of the function.

### [2.   How to get started with a serverless application ?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled2)

For getting started, the console of AWS Lambda has to be visited, and a blueprint has to be downloaded. The file downloaded will have an AWS SAM file (which is used to define AWS resources in the application), and a.ZIP file (which includes the function’s code). The AWS CloudFormation commands can then be used for packaging and deploying the serverless application just downloaded. For further details, visit the documentation.

### [3.  What does AWS Lambda mean?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled3)

AWS Lambda is one the best compute service in the market, which is serverless. It allows you to run codes without the help of managing servers or provisioning. You have to pay for the computing time when you consume data. There are no charges to be paid when you are not running your code. Using Lambda, you can quickly run codes for any application or backend service virtually, without any administration. You have to upload the code and rest everything is taken care of by Lambda. Lambda runs and scales your code with high availability. You can even set the code up to trigger from the other AWS available or give it a call directly from the mobile app or any web.

### [4. How long can an AWS Lambda function execute?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled4)

The complete execution has to take place within 300 seconds from placing the calls to AWS Lambda. 3 seconds is the default timeout however you can set any timeout value between 1 to 300 seconds

### [5.   What happens when my account surpasses the default threshold limit on the executions?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled5)

Upon exceeding the threshold limit, the AWS Lambda functions are being called synchronously and will return a threshold error (429 error- code). The tasks of Lambda functions that are called asynchronously shall absorb the reasonable traffic bursts for 15-30 minutes, after which the incoming events shall be rejected as they are throttled. In case the Lambda function is being called in response to the Amazon S3 events, events that are rejected by AWS Lambda may be retained back and retried by S3 for 24 hours. The events coming from streams of Amazon Kinesis and Amazon DynamoDB are retried along as the Lambda function doesn’t succeed, or the data doesn’t expire. Amazon Kinesis and Amazon DynamoDB Streams hold the data for 24 hours.

### [6. Which all languages are supported by AWS Lambda?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled6)

AWS Lambda supports the codes that are written in Python, C# (.NET Core), Node.js (JavaScript), Java (Java 8 compatible), and Go. The code can also include existing libraries and even the native ones.

### [7.  Are AWS Lambda functions available and to what extent?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled7)

AWS Lambda has been so designed to use redundancy and replication so that it provides high availability for both, lambda functions it operates on and the service it provides. Maintenance windows and scheduled downtimes for Lambda functions.

### [8. What restrictions apply to AWS Lambda function code?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled8)

Lambda imposes very few restrictions on operating system activities and standard language. However, there are few of the activities that have been disabled like for instance, inbound network connections and trace calls, which is a debugging system, and TCP port 25 traffic as a measure to anti-spam. For outbound connections IP/TCP sockets are supportive.

### [9.   On a functional level is there any default limit to be applied?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled9)

The default limit is applicable only at the account level. So no, there is no default limit applied at a functional level.

### [10.   What is the Disadvantage of using this approach?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled10)

Everything comes with its own merits and demerits depending on the task performed. Coming to the server-less approach, this fact is applicable here as well. In a few cases, their upper limit is strictly on the vendor control in this approach, and this means more downtime and thus more losses. The loss of system functionality and the system’s limits are other issues. Also to mention, no dedicated hardware is available for the server-less approach. Thus performance and security have become essential challenges at various stages. Sometimes errors by the customer can also give rise to the problems. New deployments, as well as the monitoring tools, have become the sole choice when the matter is of converting to functions of Google Cloud.

### [11. What is the definition of Auto-Scaling?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled11)

It is a feature available in the Web services of Amazon that helps you enable to spin and configure the novel instances automatically. At any stage, you don’t have to interfere, and one can quickly do the monitoring using thresholds and metrics. You merely have to cross the threshold to enable the task and instances without any interference that may have increased horizontally.

### [12.   Is there any limit to the quantity of AWS Lambda functions that can be executed at once?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled12)

No. The AWS Lambda is designed so that it can run some instances of functions simultaneously. However, AWS Lambda has a by default safety threshold for some consecutive runs for every account per region. The maximum successive executions for single AWS Lambda functions can be controlled which can be used to reserve a portion of the account concurrency threshold for the critical functions or lower traffic rates to downstream the resources.

If you so wish to submit a query to increase the limit, you can refer to the Support Centre for more.

### [13. Can I use packages with AWS Lambda?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled13)

Absolutely yes! You can efficiently use custom as well as NPM packages to be precise.

### [14. Is the infrastructure accessible on which the AWS Lambda runs?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled14)

No. As AWS Lambda starts operating the compute infrastructure on behalf of the user,  the foundation on which AWS Lambda runs is not accessible. It allows Lambda to apply security patches, perform health checks, and work out other routine maintenance.

### [15.    What advantages can we have by using Server-less approach?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/" \l "collapseUnfiled15)

Firstly, this approach has simple operations which provide quick time to market and better sales. Users need to only pay for when the code is compiling, and many costs can be saved by enhancing the profits. Also, managing the components of the broader application is not a big deal. In addition to this, it is not needed to have the additional infrastructure. The most significant benefit is that consumers do not need to worry about the servers on which the code is executed.

## **AWS Lambda Interview Questions**

### [1.   How can a serverless application be automated?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/page/2/" \l "collapseUnfiled1)

The server-less application’s release process can be automated by using an AWS CodePipeline and also an AWS CodeDeploy.  The CodePipeline is a continuous form of delivery service that is enabled with modeling, visualizing and automating the steps that are required, so that server less application can be released. CodeDeploy also comes with a deployment engine that is automated for Lambda-based applications. It lets you coordinate deployments as per the best-practice methodologies established like a canary and linear deployment, and assists you to develop significant barriers to ensure that the newly-deployed program is secure, stable, and ready for industrial use.

### [2. On AWS Lambda what all kinds of code can run?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/page/2/" \l "collapseUnfiled2)

AWS Lambda offers you an easy way to get many activities done in the cloud. Like for instance, AWS Lambda can be used to build mobile back-ends from Amazon DynamoDB to retrieve and transform data. Handlers that transform and compress objects as they get uploaded to Amazon S3, using Amazon Kinesis the server-less processing of streaming data, and reporting and auditing of the API calls that are made to any Web Services of Amazon are other activities can be done in the cloud with the help of AWS Lambda.

### [3.   How do I troubleshoot a serverless application?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/page/2/" \l "collapseUnfiled3)

Lambda function can be enabled for tracking, with AWS X-Ray by addition of X-Ray permissions to Lambda function’s role of execution and changing the function’s “mode of tracing” to “active.” When you enable X-ray for Lambda function, AWS Lambda shall emit the tracing information to X-Ray with information about the Lambda service that incurred while invoking the function. This shall provide you with information such as the overhead of Lambda service, the function unit time, and time for function execution. Also, the X-Ray SDK can be included in Lambda deploying the package to create one’s segments of the trace, annotate one’s marks, or view the trace segments for various downstream calls that are made from Lambda function. X-Ray SDKs are presently available for Node.js and Java. Visit the Troubleshooting applications based on Lambda to learn more. AWS X-Ray rates shall apply.

### [4. How does AWS Lambda secure my code?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/page/2/" \l "collapseUnfiled4)

What Labda does is, it stores the code in the Amazon S3 and encrypts it when it is resting. AWS Lambda is known to perform additional integrity check while the code is running.

### [5.   What is a server-less application?](https://www.onlineinterviewquestions.com/aws-lambda-interview-questions/page/2/" \l "collapseUnfiled5)

The applications which are Lambda-based (are also referred to as the server-less applications) are made of functions that are triggered by various events. A default server-less application consists of one or more of such functions that are triggered by the events such as object upload to Amazon S3, Amazon SNS, or API actions. The functions can work alone or make use of other resources like DynamoDB tables or buckets of Amazon S3. The most default serverless application is a function.

##### 1:**What exactly automate deployment is?**

It is quite similar to programming in the other languages. However, it cut down a lot of challenges associated. The best thing is the deployment of pipeline that can easily be created as one become more proficient. Automate Deployment cut down human interference and help the organizations ensure outcomes that are quality based and are best in every aspect.

## 2: What are the features in AWS lambda that automate the deployment?

There are environmental variables that are supported by AWS lambda. They can be used for data and several other credentials when it comes to modifying the deployment package. As it’s a serverless approach, it also supports aliases. There are certain types in fact that you can easily consider such as stage production and dev. Thus, functions can easily be considered for testing and without actually interrupting the production code. The end-point doesn’t change easily and thus one can keep up the pace with the task.

##### 3: What are the various ways to access EC2?

This can be done with Command Line Interface and Web Based Interface. Also, there are tools for Powershell in Windows through which it can simply be done.

##### 4: Tell us about the frameworks which are available for serverless?

There are several frameworks and serverless is extremely powerful. Its great support to Lambda and openwhisk, as well as azure functions, makes it simply the best in every aspect. When it comes to extending the cloud formation, the Serverless Application Model can easily be considered. Scripting the changes to API becomes extremely simple with this approach and the best thing is the task is very quick and reliable.

##### 5: What are the advantages of using the Serverless approach?

The very first thing about this approach is simple operations which mean quick time to market and better sales. Users only need to pay when the code is running and thus a lot o cost can simply be saved which enhances profits. Also, managing the larger application components is not a big deal. In addition to this, there is no need to have the additional infrastructure. The biggest thing is users need not to worry about the servers on which the code runs.

##### 6: Is it possible to debug and troubleshoot the micro or small services?

Yes, it’s possible. It can be performed even when the function is running and appropriate tasks are being performed.

##### 7: Is there any disadvantage of using this approach too? What do you think?

Well, everything has its own pros and cons depending on the work we perform through it. When it comes to serverless approach, the fact is applicable here too. In few cases, there is a strict upper limit on the vendor control in serverless approach and this clearly means more downtime and thus losses. The loss of functionality and system limits are the other issues. Also, there is no dedicated hardware available for the serverless approach. Thus performance and security become challenges at several stages. Sometimes customer errors can also create the problems. The new deployment, as well as monitoring tools become the only option when it comes to switching to Google Cloud functions.

##### 8: What makes Lambda a time-saving approach?

There are certain reasons for this. The one is it’s possible to simply store everything in the local server memory. Also, data can be stored directly into the database without affecting the performance. In addition to this, the testing is not much complicated. Integration testing can simply be made powerful through multiple vendors.

##### 9: What is the time limit for execution in Lambda when you perform DDOS?

The time limit is 5 minutes.

##### 10: What do you know about Zero downtime deployment?

Deployments are generally considered in the form of functions. AWS Lambda divides it into units in case they are complex. The fact here is app remains in offline mode during such time period. However, the results are always good.

##### 11: There are some of the very complex querying capabilities that need to be handled without having a warehouse? Which database do you consider during such a case?

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The Amazon RDS is a good option as others such as ElasticCache suffers from some issues.RDS makes it easy to setup and manages every task reliably. Also, it is compatible with all the modern tools.

##### 12: Among On-demand and Reserved Instances, which one is better to impose a limit on expenditure when it comes to optimizing the speed on Lambda?

Reserved Instances is a better option.

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## 13: What is EC2 service?

In Lambda, there is always a need to have scalable computing capacity while dealing with data in the cloud. EC2 is meant for the same purpose as a web service. Networking, as well as security can easily be managed. Using minimal friction, configuring capacity can also be creased with EC2.

##### 14: What do you know about AMI?

It stands for Amazon Machine Image and many times it is used in processed that are based on Lambda or even in conjunction with same. Basically, it’s a template that contains an application server, OS or other applications. It is possible to create its copy in the cloud. It has several instances and running multiple instances is also possible. AMI can also run a virtual server in a cloud.

##### 15: What do you know about Auto-Scaling?

It is basically a feature in the [Amazon Web Services](https://mindmajix.com/aws-cloud)that simply enables you to automatically configure and spin the novel instances. The good thing is there is no need for you to interfere at any stage. However, users can monitor everything through metrics and thresholds. To enable this task, you simply need to cross a threshold and you can see without any interference, the instances have scaled horizontally.

##### 16: Name the type of storage provided by Amazon

For Instances, there are several storage options provided by Amazon and the best thing is every option is best in terms of durability as well as performance. In case you want to use them in combination, there is not a problem. The independent access is also available. The first storage is EBS which is actually block-level storage. It comes with encryption feature and is a good option to consider when independent storage is required. Next type is EC2 Instance store which is directly connected to the host PC as a storage disk. For temporary needs, it is a good option to consider. The data on this storage remains valid only when the instance is valid. If same is deleted, data will also be gone. Another storage type is “Adding Storage”. When the root storage device is created, an instance is launched. It generally contains information related to boot Instance. The [Amazon S3](https://mindmajix.com/introduction-to-aws-s3) is another option available for storage which is known to be an inexpensive option and can store any amount of data.

[**Checkout Amazon EC2 Interview Questions**](https://mindmajix.com/aws-interview-questions)

##### 17: Do you think there is a relation between Instance and AMI?

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Yes, they are associated with each other. Lambda offers a query API that is good in terms of query parameters. Requests such as HTTPs can simply be handled and managed.

##### 18: What are the best practices for security in Lambda?

For security, there are some of the best options available in Lambda. One can use Identity Access and Management. This would be beneficial when it comes to controlling the access to resources. Privilege is another option that basically opens up the permissions. Access can be restricted to hosts that are not trusted or unauthorized. There are rules in the security group that can be reviewed with time to keep up the pace simply.

##### 19: What is elastic blockage storage in Lambda?

It is basically a virtual storage area network from where tasks can be started. It can tolerate faults easily and users need not to worry about the loss of data even in case the disk damages in the RAID. Provisioning and allocating the storage can also be done in Elastic Block Storage. If required, it can also be connected to the API

##### 20: Give a simple method to improve performance in AWS Lambda

This can be done simply by using the Linux software RAID. Also, better security can simply be assured.

###### 21: What do you know about building an AMI?

The very first thing is to get an Instance from another trusted [Amazon Machine Image](https://mindmajix.com/aws-ami). After this, you need to add components, as well as packages. Initially, there is no need to add data in it in case it is sensitive due to some security issues. Next is to add the access credentials post which you can sign up with a database. The total amount of data that you need to have in it can simply be enhanced up to any level depending on your need and exact requirement.

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###### 22: Is vertical scaling possible in Lambda?

Yes, it’s possible and in fact, it is one of the best features in the AWS Lambda. Basically, it is considered when you need to spin a larger instance. In case you are already using the one, it can be paused. You need to detach the same as well from the server. It’s necessary to note the Id of new device post which you can continue your process.

###### 23: What do you know about Configuration Management?

In System administration and Web operations, it is a very common and in fact the oldest approach. The process is straight-forward in case of Lambda. When large-scale automation is to be achieved, this approach is adopted. A lot of tasks can be configured and managed reliably. A lot of challenges can be eliminated simply.

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###### 24: What is SQS in Lambda? What role does it play?

SQS is basically nothing but an approach used for information sharing and passing among the different hosts and connectors. Different components of Lambda can be made accessible or in other words, communication can be made possible in them. Even if the functional components are different, they can simply be connected. A lot of failures can be eliminated simply through this approach and components can understand each other effectively.

###### 25: What do you know about Lambda Expression?

When it comes to writing shorthand code, they are generally considered. Basically, they are adopted as anonymous methods for this purpose. The productivity of developers can simply be enhanced and reliable code can simply be assured without making a lot of efforts. They are basically nameless functions.

###### 26: What are Final Variables and Effectively final variables in Lambda?

Final Variables are those which cannot be modified once assigned. When they are in an earlier stage where it is possible to make any form of changes, they are called effectively variable. The value is yet to be assigned to them. The outcome is required without restriction in many cases and that is the reason to use effective variables. They can also play a role in testing. If final variables are to be equipped with several additional features, this can be done through effective Variables. Most local expressions in Lambda are final.

###### 27: What are the use cases for which Lambda was actually designed?

Overall response to the clicks made on the website, Image uploading, Sensor’s reacting monitoring, as well as reading from the IOT devices are some of the use cases of AWS Lambda. However, the access is not just limited to this only. There are several other tasks that can also be accomplished with Lambda. Back-end services can be provisioned automatically with Lambda.

###### 28: What is a Serverless App?

It is nothing but an integration of Lambda functions that aims to accomplish some assigned tasks. It supports Node.Js

###### 29: What is the difference between anonymous class and Lambda function?

One important difference is the use of keywords. The keyword “this” in Lambda resolve to enclosing class while the same in case of Anonymous Class resolves to the anonymous class itself.

###### 30: Is Lambda Expression a nameless suspension of Code?

Yes, it is actually a nameless suspension of code.

#### **Q1) What is AWS?**

Answer:AWS stands for Amazon Web Services. AWS is a platform that provides on-demand resources for hosting web services, storage, networking, databases and other resources over the internet with a pay-as-you-go pricing.

#### **Q2)  What are the components of AWS?**

Answer:EC2 – Elastic Compute Cloud, S3 – Simple Storage Service, Route53, EBS – Elastic Block Store, Cloudwatch, Key-Paris are few of the components of AWS.

#### **Q3)  What are key-pairs?**

Answer:Key-pairs are secure login information for your instances/virtual machines. To connect to the instances we use key-pairs that contain a public-key and private-key.

#### **Q4)  What is S3?**

Answer:S3 stands for Simple Storage Service. It is a storage service that provides an interface that you can use to store any amount of data, at any time, from anywhere in the world. With S3 you pay only for what you use and the payment model is pay-as-you-go.

#### **Q5)  What are the pricing models for EC2instances?**

Answer:The different pricing model for EC2 instances are as below,

* On-demand
* Reserved
* Spot
* Scheduled
* Dedicated

#### **Q6) What are the types of volumes for EC2 instances?**

Answer:

* There are two types of volumes,
* Instance store volumes
* EBS – Elastic Block Stores

#### **Q7) What are EBS volumes?**

Answer:EBS stands for Elastic Block Stores. They are persistent volumes that you can attach to the instances. With EBS volumes, your data will be preserved even when you stop your instances, unlike your instance store volumes where the data is deleted when you stop the instances.

#### **Q8) What are the types of volumes in EBS?**

Answer:Following are the types of volumes in EBS,

* General purpose
* Provisioned IOPS
* Magnetic
* Cold HDD
* Throughput optimized

#### **Q9) What are the different types of instances?**

Answer: Following are the types of instances,

* General purpose
* Computer Optimized
* Storage Optimized
* Memory Optimized
* Accelerated Computing

#### **Q10) What is an auto-scaling and what are the components?**

Answer: Auto scaling allows you to automatically scale-up and scale-down the number of instances depending on the CPU utilization or memory utilization. There are 2 components in Auto scaling, they are Auto-scaling groups and Launch Configuration.

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#### **Q11) What are reserved instances?**

Answer: Reserved instances are the instance that you can reserve a fixed capacity of EC2 instances. In reserved instances you will have to get into a contract of 1 year or 3 years.

#### **Q12)What is an AMI?**

Answer: AMI stands for Amazon Machine Image. AMI is a template that contains the software configurations, launch permission and a block device mapping that specifies the volume to attach to the instance when it is launched.

#### **Q13) What is an EIP?**

Answer: EIP stands for Elastic IP address. It is designed for dynamic cloud computing. When you want to have a static IP address for your instances when you stop and restart your instances, you will be using EIP address.

#### **Q14) What is Cloudwatch?**

Answer: Cloudwatch is a monitoring tool that you can use to monitor your various AWS resources. Like health check, network, Application, etc.

#### **Q15) What are the types in cloudwatch?**

Answer: There are 2 types in cloudwatch. Basic monitoring and detailed monitoring. Basic monitoring is free and detailed monitoring is chargeable.

#### **Q16) What are the cloudwatch metrics that are available for EC2 instances?**

Answer: Diskreads, Diskwrites, CPU utilization, networkpacketsIn, networkpacketsOut, networkIn, networkOut, CPUCreditUsage, CPUCreditBalance.

#### **Q17) What is the minimum and maximum size of individual objects that you can store in S3**

Answer: The minimum size of individual objects that you can store in S3 is 0 bytes and the maximum bytes that you can store for individual objects is 5TB.

#### **Q18) What are the different storage classes in S3?**

Answer: Following are the types of storage classes in S3,

* Standard frequently accessed
* Standard infrequently accessed
* One-zone infrequently accessed.
* Glacier
* RRS – reduced redundancy storage

#### **Q19) What is the default storage class in S3?**

Answer: The default storage class in S3 in Standard frequently accessed.

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#### **Q20) What is glacier?**

Answer: Glacier is the back up or archival tool that you use to back up your data in S3.

#### **Q21) How can you secure the access to your S3 bucket?**

Answer: There are two ways that you can control the access to your S3 buckets,

* ACL – Access Control List
* Bucket polices

#### **Q22) How can you encrypt data in S3?**

Answer: You can encrypt the data by using the below methods,

* Server Side Encryption – S3 (AES 256 encryption)
* Server Side Encryption – KMS (Key management Service)
* Server Side Encryption – C (Client Side)

#### **Q23) What are the parameters for S3 pricing?**

Answer: The pricing model for S3 is as below,

* Storage used
* Number of requests you make
* Storage management
* Data transfer
* Transfer acceleration

#### **Q24) What is the pre-requisite to work with Cross region replication in S3?**

Answer: You need to enable versioning on both source bucket and destination to work with cross region replication. Also both the source and destination bucket should be in different region.

#### **Q25) What are roles?**

Answer: Roles are used to provide permissions to entities that you trust within your AWS account. Roles are users in another account. Roles are similar to users but with roles you do not need to create any username and password to work with the resources.

#### **Q26) What are policies and what are the types of policies?**

Answer: Policies are permissions that you can attach to the users that you create. These policies will contain that access that you have provided to the users that you have created. There are 2 types of policies.

* Managed policies
* Inline policies

#### **Q27) What is cloudfront?**

Answer: Cloudfront is an AWS web service that provided businesses and application developers an easy and efficient way to distribute their content with low latency and high data transfer speeds. Cloudfront is content delivery network of AWS.

#### **Q28) What are edge locations?**

Answer: Edge location is the place where the contents will be cached. When a user tries to access some content, the content will be searched in the edge location. If it is not available then the content will be made available from the origin location and a copy will be stored in the edge location.

#### **Q29) What is the maximum individual archive that you can store in glacier?**

Answer: You can store a maximum individual archive of upto 40 TB.

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#### **Q30) What is VPC?**

Answer: VPC stands for Virtual Private Cloud. VPC allows you to easily customize your networking configuration. VPC is a network that is logically isolated from other network in the cloud. It allows you to have your own IP address range, subnets, internet gateways, NAT gateways and security groups.

#### **Q31) What is VPC peering connection?**

Answer: VPC peering connection allows you to connect 1 VPC with another VPC. Instances in these VPC behave as if they are in the same network.

#### **Q32) What are NAT gateways?**

Answer: NAT stands for Network Address Translation. NAT gateways enables instances in a private subnet to connect to the internet but prevent the internet from initiating a connection with those instances.

#### **Q33) How can you control the security to your VPC?**

Answer: You can use security groups and NACL (Network Access Control List) to control the security to your

VPC.

#### **Q34) What are the different types of storage gateway?**

Answer: Following are the types of storage gateway.

* File gateway
* Volume gateway
* Tape gateway

#### **Q35) What is a snowball?**

Answer: Snowball is a data transport solution that used source appliances to transfer large amounts of data into and out of AWS. Using snowball, you can move huge amount of data from one place to another which reduces your network costs, long transfer times and also provides better security.

#### **Q36) What are the database types in RDS?**

Answer: Following are the types of databases in RDS,

* Aurora
* Oracle
* MYSQL server
* Postgresql
* MariaDB
* SQL server

#### **Q37) What is a redshift?**

Answer: Amazon redshift is a data warehouse product. It is a fast and powerful, fully managed, petabyte scale data warehouse service in the cloud.

### Q38) What is SNS?

Answer: SNS stands for Simple Notification Service. SNS is a web service that makes it easy to notifications from the cloud. You can set up SNS to receive email notification or message notification.

#### **Q39) What are the types of routing polices in route53?**

Answer: Following are the types of routing policies in route53,

* Simple routing
* Latency routing
* Failover routing
* Geolocation routing
* Weighted routing
* Multivalue answer

#### **Q40) What is the maximum size of messages in SQS?**

Answer: The maximum size of messages in SQS is 256 KB.

#### **Q41) What are the types of queues in SQS?**

Answer: There are 2 types of queues in SQS.

* Standard queue
* FIFO (First In First Out)

#### **Q42) What is multi-AZ RDS?**

Answer: Multi-AZ (Availability Zone) RDS allows you to have a replica of your production database in another availability zone. Multi-AZ (Availability Zone) database is used for disaster recovery. You will have an exact copy of your database. So when your primary database goes down, your application will automatically failover to the standby database.

#### **Q43) What are the types of backups in RDS database?**

Answer: There are 2 types of backups in RDS database.

* Automated backups
* Manual backups which are known as snapshots.

#### **Q44) What is the difference between security groups and network access control list?**

Answer:

|  |  |
| --- | --- |
| Security Groups | Network access control list |
| Can control the access at the instance level | Can control access at the subnet level |
| Can add rules for “allow” only | Can add rules for both “allow” and “deny” |
| Evaluates all rules before allowing the traffic | Rules are processed in order number when allowing traffic. |
| Can assign unlimited number of security groups | Can assign upto 5 security groups. |
| Statefull filtering | Stateless filtering |

#### **Q45) What are the types of load balancers in EC2?**

Answer: There are 3 types of load balancers,

* Application load balancer
* Network load balancer
* Classic load balancer

#### **Q46) What is and ELB?**

Answer: ELB stands for Elastic Load balancing. ELB automatically distributes the incoming application traffic or network traffic across multiple targets like EC2, containers, IP addresses.

#### **Q47) What are the two types of access that you can provide when you are creating users?**

Answer: Following are the two types of access that you can create.

* Programmatic access
* Console access

#### **Q48) What are the benefits of auto scaling?**

Answer: Following are the benefits of auto scaling

* Better fault tolerance
* Better availability
* Better cost management

#### **Q49) What are security groups?**

Answer: Security groups acts as a firewall that contains the traffic for one or more instances. You can associate one or more security groups to your instances when you launch then. You can add rules to each security group that allow traffic to and from its associated instances. You can modify the rules of a security group at any time, the new rules are automatically  and immediately applied to all the instances that are associated with the security group

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#### **Q50) What are shared AMI’s?**

Answer: Shared AMI’s are the AMI that are created by other developed and made available for other developed to use.

#### **Q51)What is the difference between the classic load balancer and application load balancer?**

Answer: Dynamic port mapping, multiple port multiple listeners is used in Application Load Balancer, One port one listener is achieved via Classic Load Balancer

#### **Q52) By default how many Ip address does aws reserve in a subnet?**

Answer: 5

#### **Q53) What is meant by subnet?**

Answer: A large section of IP Address divided in to chunks are known as subnets

#### **Q54) How can you convert a public subnet to private subnet?**

Answer: Remove IGW & add NAT Gateway, Associate subnet in Private route table

#### **Q55) Is it possible to reduce a ebs volume?**

Answer: no it’s not possible, we can increase it but not reduce them

#### **Q56) What is the use of elastic ip are they charged by AWS?**

Answer: These are ipv4 address which are used to connect the instance from internet, they are charged if the instances are not attached to it

#### **Q57) One of my s3 is bucket is deleted but i need to restore is there any possible way?**

Answer: If versioning is enabled we can easily restore them

#### **Q58) When I try to launch an ec2 instance i am getting Service limit exceed, how to fix the issue?**

Answer: By default AWS offer service limit of 20 running instances per region, to fix the issue we need to contact AWS support to increase the limit based on the requirement

#### **Q59) I need to modify the ebs volumes in Linux and windows is it possible**

Answer: yes its possible from console use modify volumes in section give the size u need then for windows go to disk management for Linux mount it to achieve the modification

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#### **Q60) Is it possible to stop a RDS instance, how can I do that?**

Answer: Yes it’s possible to stop rds. Instance which are non-production and non multi AZ’s

#### **Q61) What is meant by parameter groups in rds. And what is the use of it?**

Answer: Since RDS is a managed service AWS offers a wide set of parameter in RDS as parameter group which is modified as per requirement

#### **Q62) What is the use of tags and how they are useful?**

Answer: Tags are used for identification and grouping AWS Resources

#### **Q63) I am viewing an AWS Console but unable to launch the instance, I receive an IAM Error how can I rectify it?**

Answer: As AWS user I don’t have access to use it, I need to have permissions to use it further

#### **Q64) I don’t want my AWS Account id to be exposed to users how can I avoid it?**

Answer: In IAM console there is option as sign in url where I can rename my own account name with AWS account

#### **Q65) By default how many Elastic Ip address does AWS Offer?**

Answer: 5 elastic ip per region

#### **Q66) You are enabled sticky session with ELB. What does it do with your instance?**

Answer: Binds the user session with a specific instance

#### **Q67) Which type of load balancer makes routing decisions at either the transport layer or the**

#### **Application layer and supports either EC2 or VPC.**

Answer: Classic Load Balancer

#### **Q68) Which is virtual network interface that you can attach to an instance in a VPC?**

Answer: Elastic Network Interface

#### **Q69) You have launched a Linux instance in AWS EC2. While configuring security group, you**

#### **Have selected SSH, HTTP, HTTPS protocol. Why do we need to select SSH?**

Answer: To verify that there is a rule that allows traffic from EC2 Instance to your computer

#### **Q70) You have chosen a windows instance with Classic and you want to make some change to the**

#### **Security group. How will these changes be effective?**

Answer: Changes are automatically applied to windows instances

#### **Q71) Load Balancer and DNS service comes under which type of cloud service?**

Answer: IAAS-Storage

#### **Q72) You have an EC2 instance that has an unencrypted volume. You want to create another**

#### **Encrypted volume from this unencrypted volume. Which of the following steps can achieve this?**

Answer: Create a snapshot of the unencrypted volume (applying encryption parameters), copy the. Snapshot and create a volume from the copied snapshot

#### **Q73) Where does the user specify the maximum number of instances with the auto scaling Commands?**

Answer: Auto scaling Launch Config

#### **Q74) Which are the types of AMI provided by AWS?**

Answer: Instance Store backed, EBS Backed

#### **Q75) After configuring ELB, you need to ensure that the user requests are always attached to a Single instance. What setting can you use?**

Answer:  Sticky session

#### **Q76) When do I prefer to Provisioned IOPS over the Standard RDS storage?**

Answer:If you have do batch-oriented is workloads.

#### **Q77) If I am running on my DB Instance a Multi-AZ deployments, can I use to the stand by the DB Instance for read or write a operation along with to primary DB instance?**

Answer: Primary db instance does not working.

#### **Q78) Which the AWS services will you use to the collect and the process e-commerce data for the near by real-time analysis?**

Answer:  Good of Amazon DynamoDB.

#### **Q79) A company is deploying the new two-tier an web application in AWS. The company has to limited on staff and the requires high availability, and the application requires to complex queries and table joins. Which configuration provides to the solution for company’s requirements?**

Answer: An web application provide on Amazon DynamoDB solution.

#### **Q80) Which the statement use to cases are suitable for Amazon DynamoDB?**

Answer:The storing metadata for the Amazon S3 objects& The Running of relational joins and complex an updates.

#### **Q81) Your application has to the retrieve on data from your user’s mobile take every 5 minutes and then data is stored in the DynamoDB, later every day at the particular time the data is an extracted into S3 on a per user basis and then your application is later on used to visualize the data to user. You are the asked to the optimize the architecture of the backend system can to lower cost, what would you recommend do?**

Answer: Introduce Amazon Elasticache to the cache reads from the Amazon DynamoDB table and to reduce the provisioned read throughput.

#### **Q82) You are running to website on EC2 instances can deployed across multiple Availability Zones with an Multi-AZ RDS MySQL Extra Large DB Instance etc. Then site performs a high number of the small reads and the write per second and the relies on the eventual consistency model. After the comprehensive tests you discover to that there is read contention on RDS MySQL. Which is the best approaches to the meet these requirements?**

Answer:The Deploy Elasti Cache in-memory cache is  running in each availability zone and Then Increase the RDS MySQL Instance size and the Implement provisioned IOPS.

#### **Q83) An startup is running to a pilot deployment of around 100 sensors to the measure street noise and The air quality is urban areas for the 3 months. It was noted that every month to around the 4GB of sensor data are generated. The company uses to a load balanced take auto scaled layer of the EC2 instances and a RDS database with a 500 GB standard storage. The pilot was success and now they want to the deploy take atleast 100K sensors.let which to need the supported by backend. You need to the stored data for at least 2 years to an analyze it. Which setup of  following would you be prefer?**

Answer: The Replace the RDS instance with an 6 node Redshift cluster with take 96TB of storage.

#### **Q84) Let to Suppose you have an application where do you have to render images and also do some of general computing. which service will be best fit your need?**

Answer:Used on Application Load Balancer.

#### **Q85) How will change the instance give type for the instances, which are the running in your applications tier and Then using Auto Scaling. Where will you change it from areas?**

Answer: Changed to Auto Scaling launch configuration areas.

#### **Q86) You have an content management system running on the Amazon EC2 instance that is the approaching 100% CPU of utilization. Which option will be reduce load on the Amazon EC2 instance?**

Answer: Let Create a load balancer, and Give register the Amazon EC2 instance with it.

#### **Q87) What does the Connection of draining do?**

Answer: The re-routes traffic from the instances which are to be updated (or) failed an health to check.

#### **Q88) When the instance is an unhealthy, it is do terminated and replaced with an new ones, which of the services does that?**

Answer: The survice make a fault tolerance.

#### **Q89) What are the life cycle to hooks used for the AutoScaling?**

Answer: They are used to the  put an additional taken wait time to the scale in or scale out events.

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#### **Q90) An user has to setup an Auto Scaling group. Due to some issue the group has to failed for launch a single instance for the more than 24 hours. What will be happen to the Auto Scaling in the condition?**

Answer: The auto Scaling will be suspend to the scaling process.

#### **Q91) You have an the EC2 Security Group with a several running to EC2 instances. You changed to the Security of Group rules to allow the inbound traffic on a new port and protocol, and then the launched a several new instances in the same of Security Group.Such the new rules apply?**

Answer:The Immediately to all the instances in security groups.

#### **Q92) To create an mirror make a image of your environment in another region for the disaster recoverys, which of the following AWS is resources do not need to be recreated in second region?**

Answer: May be the selected on Route 53 Record Sets.

#### **Q93) An customers wants to the captures all client connections to get information from his load balancers at an interval of 5 minutes only, which cal select option  should he choose for his application?**

Answer: The condition should be Enable to AWS CloudTrail for the loadbalancers.

#### **Q94) Which of the services to you would not use to deploy an app?**

Answer: Lambda app not used on deploy.

#### **Q95) How do the Elastic Beanstalk can apply to updates?**

Answer: By a duplicate ready with a updates prepare before swapping.

#### **Q96) An created a key in the oregon region to encrypt of my data in North Virginia region for security purposes. I added to two users to the key and the external AWS accounts. I wanted to encrypt an the object in S3, so when I was tried, then key that I just created is not listed.What could be reason&solution?**

Answer:The Key should be working in the same region.

#### **Q97) As a company needs to monitor a read and write IOPS for the AWS MySQL RDS instances and then send real-time alerts to the operations of team. Which AWS services to can accomplish this?**

Answer:The monitoring on Amazon CloudWatch

Q98) The organization that is currently using the consolidated billing has to recently acquired to another company that already has a number of the AWS accounts. How could an Administrator to ensure that all the AWS accounts, from the both existing company and then acquired company, is billed to the single account?

Answer: All Invites take acquired the company’s AWS account to join  existing the company’s of organization by using AWS Organizations.

#### **Q99) The user has created an the applications, which will be hosted on the EC2. The application makes calls to the Dynamo DB to fetch on certain data. The application using the DynamoDB SDK to connect with  the EC2 instance. Which of  respect to  best practice for the security in this scenario?**

Answer: The user should be attach an IAM roles with the DynamoDB access to  EC2 instance.

#### **Q100) You have an application are running on EC2 Instance, which will allow users to download the files from a private S3 bucket using the pre-assigned URL. Before generating to URL the Q101) application should be verify the existence of file in S3. How do the application use the AWS credentials to access  S3 bucket securely?**

Answer:An  Create an IAM role for the EC2 that allows list access to objects in  S3 buckets. Launch to instance with this role, and retrieve an role’s credentials from  EC2 Instance make metadata.

#### **Q101) You use the Amazon CloudWatch as your primary monitoring system for web application. After a recent to software deployment, your users are to getting Intermittent the 500 Internal Server to the Errors, when you using web application. You want to create the CloudWatch alarm, and notify the on-call engineer let when these occur. How can you accomplish the using the AWS services?**

Answer: An Create a CloudWatch get Logs to group and A define metric filters that assure capture 500 Internal Servers should  be  Errors. Set a CloudWatch alarm on the metric and By Use of  Amazon Simple to create a Notification Service to notify an the on-call engineers when prepare CloudWatch alarm is triggered.

#### **Q102) You are designing a multi-platform of web application for the AWS. The application will run on the EC2 instances and Till will be accessed from PCs, tablets and smart phones.Then Supported accessing a platforms are Windows, MACOS, IOS and Android. They Separate sticky sessions and SSL certificate took setups are required for the different platform types. Which do describes the most cost effective and Like performance efficient the architecture setup?**

Answer:Assign to multiple ELBs  an EC2 instance or group of EC2 take instances running to common component  of the web application, one ELB change  for each platform type.Take Session will be stickiness and SSL termination are done for the ELBs.

#### **Q103) You are migrating to legacy client-server application for AWS. The application responds to a specific DNS visible domain (e.g. www.example.com) and server 2-tier architecture, with multiple application for the servers and the database server. Remote clients use to TCP to connect to the application of servers. The application servers need to know the IP address of clients in order to  the function of properly and are currently taking of that information from  TCP socket. A Multi-AZ RDS MySQL instance to will be used for database. During the migration you  change the application code but you have file a change request. How do would you implement the architecture on the AWS in order to maximize scalability and high availability?**

Answer: File a change request to get implement of Proxy Protocol support in the application. Use of ELB with TCP Listener and A Proxy Protocol enabled to distribute the  load on two application servers in the different AZs.

#### **Q104) Your application currently is leverages AWS Auto Scaling to the grow and shrink as a load Increases/decreases and has been performing as well. Your marketing a team expects and steady ramp up in traffic to follow an upcoming campaign that will result in 20x growth in the traffic over 4 weeks. Your forecast for approximate number of the Amazon EC2 instances necessary to meet  peak demand is 175. What should be you do  avoid potential service disruptions during the ramp up traffic?**

Answer: Check the service limits in the Trusted Advisors and adjust as necessary, so that forecasted count remains within  the limits.

#### **Q105) You have a web application running on the six Amazon EC2 instances, consuming about 45% of resources on the each instance. You are using the auto-scaling to make sure that a six instances are running at all times. The number of requests this application processes to consistent and does not experience to spikes. Then application are critical to your business and you want to high availability for at all times. You want to the load be distributed evenly has between all instances. You also want to between use same Amazon Machine Image (AMI) for all instances. Which are  architectural choices should you make?**

Answer: Deploy  to 3 EC2 instances in one  of availability zone and 3 in another availability of zones and to use of Amazon Elastic is Load Balancer.

#### **Q106) You are the designing an application that a contains protected health information. Security and Then compliance requirements for your application mandate that all protected to health information in application use to encryption at rest and in the transit module. The application to uses an three-tier architecture. where should data flows through the load balancers and is stored on the Amazon EBS volumes for the processing, and the results are stored in the Amazon S3 using a AWS SDK. Which of the options satisfy the security requirements?**

Answer: Use TCP load balancing on load balancer system, SSL termination on Amazon to create EC2 instances, OS-level disk  take encryption on Amazon EBS volumes, and The amazon S3 with server-side to encryption and Use the SSL termination on load balancers, an SSL listener on the Amazon to create EC2 instances, Amazon EBS encryption on the EBS volumes containing the PHI, and Amazon S3 with a server-side of encryption.

#### **Q107) An startup deploys its create photo-sharing site in a VPC. An elastic load balancer distributes to web traffic across two the subnets. Then the load balancer session to stickiness is configured to use of AWS-generated session cookie, with a session TTL of the 5 minutes. The web server to change Auto Scaling group is configured as like min-size=4, max-size=4. The startup is the preparing for a public launchs, by running the load-testing software installed on the single Amazon Elastic Compute Cloud (EC2) instance to running in us-west-2a. After 60 minutes of load-testing, the web server logs of show the following:WEBSERVER LOGS | # of HTTP requests to from load-tester system | # of HTTP requests  to from private on beta users || webserver #1 (subnet an us-west-2a): | 19,210 | 434 | webserver #2 (subnet an us-west-2a): | 21,790 | 490 || webserver #3 (subnet an us-west-2b): | 0 | 410 || webserver #4 (subnet an us-west-2b): | 0 | 428 |Which as recommendations can be help of  ensure that load-testing HTTP requests are will evenly distributed across to four web servers?**

Answer:Result of cloud is re-configure the load-testing software to the re-resolve DNS for each web request.

#### **Q108) To serve the Web traffic for a popular product to your chief financial officer and IT director have purchased 10 m1.large heavy utilization of Reserved Instances (RIs) evenly put spread across two availability zones: Route 53 are used to deliver the traffic to on Elastic Load Balancer (ELB). After the several months, the product grows to even more popular and you need to additional capacity As a result, your company that purchases two c3.2xlarge medium utilization RIs You take register the two c3.2xlarge instances on with your ELB and quickly find that the ml of large instances at 100% of capacity and the c3.2xlarge instances have significant to capacity that’s can unused Which option is the most of cost effective and uses EC2 capacity most of effectively?**

Answer: To use a separate ELB for the each instance type and the distribute load to ELBs with a Route 53 weighted round of  robin.

#### **Q109) An AWS customer are deploying an web application that is the composed of a front-end running on the Amazon EC2 and confidential data that are stored on the Amazon S3. The customer security policy is that all accessing operations to this sensitive data must authenticated and authorized by centralized access to management system that is operated by separate security team. In addition, the web application team that be owns and administers the EC2 web front-end instances are prohibited from having the any ability to access data that circumvents this centralized access to management system. Which are configurations will support these requirements?**

Answer:The configure to the web application get authenticate end-users against the centralized access on the  management system. Have a web application provision trusted to users STS tokens an entitling the download of the approved data directly from a Amazon S3.

#### **Q110) A Enterprise customer is starting on their migration to the cloud, their main reason for the migrating is agility and they want to the make their internal Microsoft active directory available to the many applications running on AWS, this is so internal users for only have to remember one set of the credentials and as a central point of user take control for the leavers and joiners. How could they make their actions the directory secures and the highly available with minimal on-premises on infrastructure changes in the most cost and the time-efficient way?**

Answer: By Using a VPC, they could be create an the extension to their data center and to  make use of resilient hardware IPSEC on tunnels, they could then have two domain consider to controller instances that are joined to the existing domain and reside within the different subnets in the different availability zones.

[*Enroll Now!*](https://www.gangboard.com/cloud-computing-training/aws-training?utm_source=GB)

#### **Q111)What is Cloud Computing?**

Answer:Cloud computing means it provides services to access programs, application, storage, network, server over the internet through browser or client side application on your PC, Laptop, Mobile by the end user without installing, updating and maintaining them.

#### **Q112)Why we go for Cloud Computing?**

Answer:

* Lower computing cost
* Improved Performance
* No IT Maintenance
* Business connectivity
* Easily upgraded
* Device Independent

#### **Q113)What are the deployment models using in Cloud?**

Answer:

* Private Cloud
* Public Cloud
* Hybrid cloud
* Community cloud 4

#### **Q114)Explain Cloud Service Models?**

Answer: SAAS (Software as a Service): It is software distribution model in which application are hosted by a vendor over the internet for the end user freeing from complex software and hardware management. (Ex: Google drive, drop box)

PAAS (Platform as a Service): It provides platform and environment to allow developers to build applications. It frees developers without going into the complexity of building and maintaining the infrastructure. (Ex: AWS Elastic Beanstalk, Windows Azure)

IAAS (Infrastructure as a Service): It provides virtualized computing resources over the internet like cpu, memory, switches, routers, firewall, Dns, Load balancer (Ex: Azure, AWS)

#### **Q115)What are the advantage of Cloud Computing?**

Answer:

* Pay per use
* Scalability
* Elasticity
* High Availability
* Increase speed and Agility
* Go global in Minutes

#### **Q116)What is AWS?**

Answer: Amazon web service is a secure cloud services platform offering compute, power, database, storage, content delivery and other functionality to help business scale and grow.

AWS is fully on-demand

AWS is Flexibility, availability and Scalability

AWS is Elasticity: scale up and scale down as needed.

#### **Q117)What is mean by Region, Availability Zone and Edge Location?**

Answer: Region: An independent collection of AWS resources in a defined geography. A collection of Data centers (Availability zones). All availability zones in a region connected by high bandwidth.

Availability Zones: An Availability zone is a simply a data center. Designed as independent failure zone. High speed connectivity, Low latency.

Edge Locations: Edge location are the important part of AWS Infrastructure. Edge locations are CDN endpoints for cloud front to deliver content to end user with low latency

#### **Q118)How to access AWS Platform?**

Answer:

* AWS Console
* AWS CLI (Command line interface)
* AWS SDK (Software Development Kit)

#### **Q119)What is EC2? What are the benefits in EC2?**

Amazon Elastic compute cloud is a web service that provides resizable compute capacity in the cloud.AWS EC2 provides scalable computing capacity in the AWS Cloud. These are the virtual servers also called as an instances. We can use the instances pay per use basis.

Benefits:

* Easier and Faster
* Elastic and Scalable
* High Availability
* Cost-Effective

#### **Q120)What are the pricing models available in AWS EC2?**

Answer:

* On-Demand Instances
* Reserved Instances
* Spot Instances
* Dedicated Host

#### **Q121)What are the types using in AWS EC2?**

Answer:

* General Purpose
* Compute Optimized
* Memory optimized
* Storage Optimized
* Accelerated Computing (GPU Based)

#### **Q122)What is AMI? What are the types in AMI?**

Answer:

Amazon machine image is a special type of virtual appliance that is used to create a virtual machine within the amazon Elastic compute cloud. AMI defines the initial software that will be in an instance when it is launched.

Types of AMI:

* Published by AWS
* AWS Marketplace
* Generated from existing instances
* Uploaded virtual server

#### **Q123)How to Addressing AWS EC2 instances?**

Answer:

* Public Domain name system (DNS) name: When you launch an instance AWS creates a DNS name that can be used to access the
* Public IP: A launched instance may also have a public ip address This IP address assigned from the address reserved by AWS and cannot be specified.
* Elastic IP: An Elastic IP Address is an address unique on the internet that you reserve independently and associate with Amazon EC2 instance. This IP Address persists until the customer release it and is not tried to

#### **Q124)What is Security Group?**

Answer: AWS allows you to control traffic in and out of your instance through virtual firewall called Security groups. Security groups allow you to control traffic based on port, protocol and source/Destination.

#### **Q125)When your instance show retired state?**

Answer:Retired state only available in Reserved instances. Once the reserved instance reserving time (1 yr/3 yr) ends it shows Retired state.

#### **Q126)Scenario: My EC2 instance IP address change automatically while instance stop and start. What is the reason for that and explain solution?**

Answer:AWS assigned Public IP automatically but it’s change dynamically while stop and start. In that case we need to assign Elastic IP for that instance, once assigned it doesn’t change automatically.

#### **Q127)What is Elastic Beanstalk?**

Answer:AWS Elastic Beanstalk is the fastest and simplest way to get an application up and running on AWS.Developers can simply upload their code and the service automatically handle all the details such as resource provisioning, load balancing, Auto scaling and Monitoring.

#### **Q128)What is Amazon Lightsail?**

Answer:Lightsail designed to be the easiest way to launch and manage a virtual private server with AWS.Lightsail plans include everything you need to jumpstart your project a virtual machine, ssd based storage, data transfer, DNS Management and a static ip.

#### **Q129)What is EBS?**

Answer:Amazon EBS Provides persistent block level storage volumes for use with Amazon EC2 instances. Amazon EBS volume is automatically replicated with its availability zone to protect component failure offering high availability and durability. Amazon EBS volumes are available in a variety of types that differ in performance characteristics and Price.

#### **Q130)How to compare EBS Volumes?**

Answer: Magnetic Volume: Magnetic volumes have the lowest performance characteristics of all Amazon EBS volume types.

EBS Volume size: 1 GB to 1 TB Average IOPS: 100 IOPS Maximum throughput: 40-90 MB

General-Purpose SSD: General purpose SSD volumes offers cost-effective storage that is ideal for a broad range of workloads. General purpose SSD volumes are billed based on the amount of data space provisioned regardless of how much of data you actually store on the volume.

EBS Volume size: 1 GB to 16 TB Maximum IOPS: upto 10000 IOPS Maximum throughput: 160 MB

Provisioned IOPS SSD: Provisioned IOPS SSD volumes are designed to meet the needs of I/O intensive workloads, particularly database workloads that are sensitive to storage performance and consistency in random access I/O throughput. Provisioned IOPS SSD Volumes provide predictable, High performance.

EBS Volume size: 4 GB to 16 TB Maximum IOPS: upto 20000 IOPS Maximum throughput: 320 MB

#### **Q131)What is cold HDD and Throughput-optimized HDD?**

Answer: Cold HDD: Cold HDD volumes are designed for less frequently accessed workloads. These volumes are significantly less expensive than throughput-optimized HDD volumes.

EBS Volume size: 500 GB to 16 TB Maximum IOPS: 200 IOPS Maximum throughput: 250 MB

Throughput-Optimized HDD: Throughput-optimized HDD volumes are low cost HDD volumes designed for frequent access, throughput-intensive workloads such as big data, data warehouse.

EBS Volume size: 500 GB to 16 TB Maximum IOPS: 500 IOPS Maximum throughput: 500 MB

#### **Q132)What is Amazon EBS-Optimized instances?**

Answer: Amazon EBS optimized instances to ensure that the Amazon EC2 instance is prepared to take advantage of the I/O of the Amazon EBS Volume. An amazon EBS-optimized instance uses an optimized configuration stack and provide additional dedicated capacity for Amazon EBS I/When you select Amazon EBS-optimized for an instance you pay an additional hourly charge for that instance.

#### **Q133)What is EBS Snapshot?**

Answer:

* It can back up the data on the EBS Volume. Snapshots are incremental backups.
* If this is your first snapshot it may take some time to create. Snapshots are point in time copies of volumes.

#### **Q134)How to connect EBS volume to multiple instance?**

Answer: We can’t able to connect EBS volume to multiple instance, but we can able to connect multiple EBS Volume to single instance.

#### **Q135)What are the virtualization types available in AWS?**

Answer: Hardware assisted Virtualization: HVM instances are presented with a fully virtualized set of hardware and they executing boot by executing master boot record of the root block device of the image. It is default Virtualization.

Para virtualization: This AMI boot with a special boot loader called PV-GRUB. The ability of the guest kernel to communicate directly with the hypervisor results in greater performance levels than other  virtualization approaches but they cannot take advantage of hardware extensions such as networking,  GPU etc. Its customized Virtualization image. Virtualization image can be used only for particular service.

#### **Q136)Differentiate Block storage and File storage?**

Answer:

Block Storage: Block storage operates at lower level, raw storage device level and manages data as a set of numbered, fixed size blocks.

File Storage: File storage operates at a higher level, the operating system level and manage data as a named hierarchy of files and folders.

#### **Q137)What are the advantage and disadvantage of EFS? Advantages:**

Answer:

* Fully managed service
* File system grows and shrinks automatically to petabytes
* Can support thousands of concurrent connections
* Multi AZ replication
* Throughput scales automatically to ensure consistent low latency Disadvantages:
* Not available in all region
* Cross region capability not available
* More complicated to provision compared to S3 and EBS

#### **Q138)what are the things we need to remember while creating s3 bucket?**

Answer:

* Amazon S3 and Bucket names are
* This means bucket names must be unique across all AWS
* Bucket names can contain upto 63 lowercase letters, numbers, hyphens and
* You can create and use multiple buckets
* You can have upto 100 per account by

#### **Q139)What are the storage class available in Amazon s3?**

Answer:

* Amazon S3 Standard
* Amazon S3 Standard-Infrequent Access
* Amazon S3 Reduced Redundancy Storage
* Amazon Glacier

#### **Q140)Explain Amazon s3 lifecycle rules?**

Answer: Amazon S3 lifecycle configuration rules, you can significantly reduce your storage costs by automatically transitioning data from one storage class to another or even automatically delete data after  a period of time.

* Store backup data initially in Amazon S3 Standard
* After 30 days, transition to Amazon Standard IA
* After 90 days, transition to Amazon Glacier
* After 3 years, delete

#### **Q141)What is the relation between Amazon S3 and AWS KMS?**

Answer: To encrypt Amazon S3 data at rest, you can use several variations of Server-Side Encryption. Amazon S3 encrypts your data at the object level as it writes it to disks in its data centers and decrypt it for you when you access it’ll SSE performed by Amazon S3 and AWS Key Management Service (AWS KMS) uses the 256-bit Advanced Encryption Standard (AES).

#### **Q142)What is the function of cross region replication in Amazon S3?**

Answer: Cross region replication is a feature allows you asynchronously replicate all new objects in the source bucket in one AWS region to a target bucket in another region. To enable cross-region replication, versioning must be turned on for both source and destination buckets. Cross region replication is commonly used to reduce the latency required to access objects in Amazon S3

#### **Q143)How to create Encrypted EBS volume?**

Answer: You need to select Encrypt this volume option in Volume creation page. While creation a new master key will be created unless you select a master key that you created separately in the service. Amazon uses the AWS key management service (KMS) to handle key management.

#### **Q144)Explain stateful and Stateless firewall.**

Answer:

Stateful Firewall: A Security group is a virtual stateful firewall that controls inbound and outbound network traffic to AWS resources and Amazon EC2 instances. Operates at the instance level. It supports allow rules only. Return traffic is automatically allowed, regardless of any rules.

Stateless Firewall: A Network access control List (ACL) is a virtual stateless firewall on a subnet level. Supports allow rules and deny rules. Return traffic must be explicitly allowed by rules.

#### **Q145)What is NAT Instance and NAT Gateway?**

Answer:

NAT instance: A network address translation (NAT) instance is an Amazon Linux machine Image (AMI) that is designed to accept traffic from instances within a private subnet, translate the source IP address to the Public IP address of the NAT instance and forward the traffic to IWG.

NAT Gateway: A NAT gateway is an Amazon managed resources that is designed to operate just like a NAT instance but it is simpler to manage and highly available within an availability Zone. To allow instance within a private subnet to access internet resources through the IGW via a NAT gateway.

#### **Q146)What is VPC Peering?**

Answer: Amazon VPC peering connection is a networking connection between two amazon vpc’s that enables instances in either Amazon VPC to communicate with each other as if they are within the same network. You can create amazon VPC peering connection between your own Amazon VPC’s or Amazon VPC in another AWS account within a single region.

#### **Q147)What is MFA in AWS?**

Answer: Multi factor Authentication can add an extra layer of security to your infrastructure by adding a second method of authentication beyond just password or access key.

#### **Q148)What are the Authentication in AWS?**

Answer:

* User Name/Password
* Access Key
* Access Key/ Session Token

#### **Q149)What is Data warehouse in AWS?**

Data ware house is a central repository for data that can come from one or more sources. Organization typically use data warehouse to compile reports and search the database using highly complex queries. Data warehouse also typically updated on a batch schedule multiple times per day or per hour compared to an OLTP (Online Transaction Processing) relational database that can be updated thousands of times per second.

#### **Q150)What is mean by Multi-AZ in RDS?**

Answer: Multi AZ allows you to place a secondary copy of your database in another availability zone for disaster recovery purpose. Multi AZ deployments are available for all types of Amazon RDS Database engines. When you create s Multi-AZ DB instance a primary instance is created in one Availability Zone and a secondary instance is created by another Availability zone.

#### **Q151)What is Amazon Dynamo DB?**

Answer: Amazon Dynamo DB is fully managed NoSQL database service that provides fast and predictable performance with seamless scalability. Dynamo DB makes it simple and Cost effective to store and retrieve any amount of data.

#### **Q152)What is cloud formation?**

Answer: Cloud formation is a service which creates the AWS infrastructure using code. It helps to reduce time to manage resources. We can able to create our resources Quickly and faster.

#### **Q153)How to plan Auto scaling?**

Answer:

* Manual Scaling
* Scheduled Scaling
* Dynamic Scaling

#### **Q154)What is Auto Scaling group?**

Answer: Auto Scaling group is a collection of Amazon EC2 instances managed by the Auto scaling service. Each auto scaling group contains configuration options that control when auto scaling should launch new instance or terminate existing instance.

#### **Q155)Differentiate Basic and Detailed monitoring in cloud watch?**

Answer:

Basic Monitoring: Basic monitoring sends data points to Amazon cloud watch every five minutes for a limited number of preselected metrics at no charge.

Detailed Monitoring: Detailed monitoring sends data points to amazon CloudWatch every minute and allows data aggregation for an additional charge.

#### **Q156)What is the relationship between Route53 and Cloud front?**

Answer: In Cloud front we will deliver content to edge location wise so here we can use Route 53 for Content Delivery Network. Additionally, if you are using Amazon CloudFront you can configure Route 53 to route Internet traffic to those resources.

#### **Q157)What are the routing policies available in Amazon Route53?**

Answer:

* Simple
* Weighted
* Latency Based
* Failover
* Geolocation

#### **Q158)What is Amazon ElastiCache?**

Answer: Amazon ElastiCache is a web services that simplifies the setup and management of distributed in memory caching environment.

* Cost Effective
* High Performance
* Scalable Caching Environment
* Using Memcached or Redis Cache Engine

#### **Q159)What is SES, SQS and SNS?**

Answer: SES (Simple Email Service): SES is SMTP server provided by Amazon which is designed to send bulk mails to customers in a quick and cost-effective manner.SES does not allows to configure mail server.

SQS (Simple Queue Service): SQS is a fast, reliable and scalable, fully managed message queuing service. Amazon SQS makes it simple and cost Effective. It’s temporary repository for messages to waiting for processing and acts as a buffer between the component producer and the consumer.

SNS (Simple Notification Service): SNS is a web service that coordinates and manages the delivery or sending of messages to recipients.

#### **Q160)How To Use Amazon Sqs? What Is Aws?**

Answer:Amazon Web Services is a secure cloud services stage, offering compute power, database storage, content delivery and other functionality to help industries scale and grow.

#### **Q161) What is the importance of buffer in AWS?**

Answer:low price – Consume only the amount of calculating, storage and other IT devices needed. No long-term assignation, minimum spend or up-front expenditure is required.

Elastic and Scalable – Quickly Rise and decrease resources to applications to satisfy customer demand and control costs. Avoid provisioning maintenance up-front for plans with variable consumption speeds or low lifetimes.

#### **Q162)What is the way to secure data for resounding in the cloud?**

Answer:

* Avoid storage sensitive material in the cloud. …
* Read the user contract to find out how your cloud service storing works. …
* Be serious about passwords. …
* Encrypt. …
* Use an encrypted cloud service.

#### **Q163) Name The Several Layers Of Cloud Computing?**

Answer:Cloud computing can be damaged up into three main services: Software-as-a-Service (SaaS), Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS). PaaS in the middle, and IaaS on the lowest

#### **Q164) What Is Lambda edge In Aws?**

Answer:Lambda Edge lets you run Lambda functions to modify satisfied that Cloud Front delivers, executing the functions in AWS locations closer to the viewer. The functions run in response to Cloud Front events, without provisioning or managing server.

#### **Q165) Distinguish Between Scalability And Flexibility?**

Answer:Cloud computing offers industries flexibility and scalability when it comes to computing needs:

Flexibility. Cloud computing agrees your workers to be more flexible – both in and out of the workplace. Workers can access files using web-enabled devices such as smartphones, laptops and notebooks. In this way, cloud computing empowers the use of mobile technology.

One of the key assistances of using cloud computing is its scalability. Cloud computing allows your business to easily expensive or downscale your IT requests as and when required. For example, most cloud service workers will allow you to increase your existing resources to accommodate increased business needs or changes. This will allow you to support your commercial growth without exclusive changes to your present IT systems.

#### **Q166) What is IaaS?**

Answer:IaaS is a cloud service that runs services on “pay-for-what-you-use” basis

IaaS workers include Amazon Web Services, Microsoft Azure and Google Compute Engine

Users: IT Administrators

#### **Q167) What is PaaS?**

Answer:PaaS runs cloud platforms and runtime environments to develop, test and manage software

Users: Software Developers

#### **Q168) What is SaaS?**

Answer:In SaaS, cloud workers host and manage the software application on a pay-as-you-go pricing model

Users: End Customers

#### **Q169) Which Automation Gears Can Help With Spinup Services?**

Answer:The API tools can be used for spin up services and also for the written scripts. Persons scripts could be coded in Perl, bash or other languages of your preference. There is one more option that is flowery management and stipulating tools such as a dummy or improved descendant. A tool called Scalar can also be used and finally we can go with a controlled explanation like a Right scale. Which automation gears can help with pinup service.

#### **Q170) What Is an Ami? How Do I Build One?**

Answer:An Amazon Machine Image (AMI) explains the programs and settings that will be applied when you launch an EC2 instance. Once you have finished organizing the data, services, and submissions on your ArcGIS Server instance, you can save your work as a custom AMI stored in Amazon EC2. You can scale out your site by using this institution AMI to launch added instances

Use the following process to create your own AMI using the AWS Administration Console:

\*Configure an EC2 example and its attached EBS volumes in the exact way you want them created in the custom AMI.

1. Log out of your instance, but do not stop or terminate it.
2. Log in to the AWS Management Console, display the EC2 page for your region, then click Instances.
3. Choose the instance from which you want to create a custom AMI.
4. Click Actions and click Create Image.
5. Type a name for Image Name that is easily identifiable to you and, optionally, input text for Image Description.
6. Click Create Image.

Read the message box that appears. To view the AMI standing, go to the AMIs page. Here you can see your AMI being created. It can take a though to create the AMI. Plan for at least 20 minutes, or slower if you’ve connected a lot of additional applications or data.

#### **Q171)What Are The Main Features Of Amazon Cloud Front?**

Answer:Amazon Cloud Front is a web service that speeds up delivery of your static and dynamic web content, such as .html, .css, .js, and image files, to your users.CloudFront delivers your content through a universal network of data centers called edge locations

#### **Q172)What Are The Features Of The Amazon Ec2 Service?**

Answer:Amazon Elastic Calculate Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud calculating easier for designers. Amazon EC2’s simple web serviceinterface allows you to obtain and configure capacity with minimal friction.

#### **Q173)Explain Storage For Amazon Ec2 Instance.?**

Answer:An instance store is a provisional storing type located on disks that are physically attached to a host machine. … This article will present you to the AWS instance store storage type, compare it to AWS Elastic Block Storage (AWS EBS), and show you how to backup data stored on instance stores to AWS EBS

Amazon SQS is a message queue service used by scattered requests to exchange messages through a polling model, and can be used to decouple sending and receiving components

#### **Q174)When attached to an Amazon VPC which two components provide connectivity with external networks?**

Answer:

* Internet Gateway {IGW)
* Virtual Private Gateway (VGW)

#### **Q175)Which of the following are characteristics of Amazon VPC subnets?**

Answer:

* Each subnet maps to a single Availability Zone.
* By defaulting, all subnets can route between each other, whether they are private or public.

#### **Q176)How can you send request to Amazon S3?**

Answer:Every communication with Amazon S3 is either genuine or anonymous. Authentication is a process of validating the individuality of the requester trying to access an Amazon Web Services (AWS) product. Genuine requests must include a autograph value that authenticates the request sender. The autograph value is, in part, created from the requester’s AWS access keys (access key identification and secret access key).

#### **Q177)What is the best approach to anchor information for conveying in the cloud ?**

Answer:Backup Data Locally. A standout amongst the most vital interesting points while overseeing information is to guarantee that you have reinforcements for your information,

* Avoid Storing Sensitive Information. …
* Use Cloud Services that Encrypt Data. …
* Encrypt Your Data. …
* Install Anti-infection Software. …
* Make Passwords Stronger. …
* Test the Security Measures in Place.

#### **Q178)What is AWS Certificate Manager ?**

Answer:AWS Certificate Manager is an administration that lets you effortlessly arrangement, oversee, and send open and private Secure Sockets Layer/Transport Layer Security (SSL/TLS) endorsements for use with AWS administrations and your inward associated assets. SSL/TLS declarations are utilized to anchor arrange interchanges and set up the character of sites over the Internet and additionally assets on private systems. AWS Certificate Manager expels the tedious manual procedure of obtaining, transferring, and reestablishing SSL/TLS endorsements.

#### **Q179)What is the AWS Key Management Service**

Answer:AWS Key Management Service (AWS KMS) is an overseen benefit that makes it simple for you to make and control the encryption keys used to scramble your information. … AWS KMS is additionally coordinated with AWS CloudTrail to give encryption key use logs to help meet your inspecting, administrative and consistence needs.

#### **Q180)**

#### **What is Amazon EMR ?**

Answer:Amazon Elastic MapReduce (EMR) is one such administration that gives completely oversaw facilitated Hadoop system over Amazon Elastic Compute Cloud (EC2).

#### **Q181)What is Amazon Kinesis Firehose ?**

Answer:Amazon Kinesis Data Firehose is the least demanding approach to dependably stack gushing information into information stores and examination devices. … It is a completely overseen benefit that consequently scales to coordinate the throughput of your information and requires no continuous organization

#### **Q182)What Is Amazon CloudSearch and its highlights ?**

Answer:Amazon CloudSearch is a versatile cloud-based hunt benefit that frames some portion of Amazon Web Services (AWS). CloudSearch is normally used to incorporate tweaked seek abilities into different applications. As indicated by Amazon, engineers can set a pursuit application up and send it completely in under 60 minutes.

#### **Q183)Is it feasible for an EC2 exemplary occurrence to wind up an individual from a virtual private cloud?**

Answer:Amazon Virtual Private Cloud (Amazon VPC) empowers you to characterize a virtual system in your very own consistently disengaged zone inside the AWS cloud, known as a virtual private cloud (VPC). You can dispatch your Amazon EC2 assets, for example, occasions, into the subnets of your VPC. Your VPC nearly looks like a conventional system that you may work in your very own server farm, with the advantages of utilizing adaptable foundation from AWS. You can design your VPC; you can choose its IP address extend, make subnets, and arrange course tables, organize portals, and security settings. You can interface occurrences in your VPC to the web or to your own server farm

#### **Q184)Mention crafted by an Amazon VPC switch.**

Answer:VPCs and Subnets. A virtual private cloud (VPC) is a virtual system committed to your AWS account. It is consistently segregated from other virtual systems in the AWS Cloud. You can dispatch your AWS assets, for example, Amazon EC2 cases, into your VPC.

#### **Q185)How would one be able to associate a VPC to corporate server farm?**

Answer:AWS Direct Connect empowers you to safely associate your AWS condition to your on-premises server farm or office area over a standard 1 gigabit or 10 gigabit Ethernet fiber-optic association. AWS Direct Connect offers committed fast, low dormancy association, which sidesteps web access suppliers in your system way. An AWS Direct Connect area gives access to Amazon Web Services in the locale it is related with, and also access to different US areas. AWS Direct Connect enables you to consistently parcel the fiber-optic associations into numerous intelligent associations called Virtual Local Area Networks (VLAN). You can exploit these intelligent associations with enhance security, separate traffic, and accomplish consistence necessities.

#### **Q186)Is it conceivable to push off S3 with EC2 examples ?**

Answer:Truly, it very well may be pushed off for examples with root approaches upheld by local event stockpiling. By utilizing Amazon S3, engineers approach the comparative to a great degree versatile, reliable, quick, low-valued information stockpiling substructure that Amazon uses to follow its own overall system of sites. So as to perform frameworks in the Amazon EC2 air, engineers utilize the instruments giving to stack their Amazon Machine Images (AMIs) into Amazon S3 and to exchange them between Amazon S3 and Amazon EC2. Extra use case may be for sites facilitated on EC2 to stack their stationary substance from S3.

#### **Q187)What is the distinction between Amazon S3 and EBS ?**

Answer:EBS is for mounting straightforwardly onto EC2 server examples. S3 is Object Oriented Storage that isn’t continually waiting be gotten to (and is subsequently less expensive). There is then much less expensive AWS Glacier which is for long haul stockpiling where you don’t generally hope to need to get to it, however wouldn’t have any desire to lose it.

There are then two principle kinds of EBS – HDD (Hard Disk Drives, i.e. attractive turning circles), which are genuinely ease back to access, and SSD, which are strong state drives which are excessively quick to get to, yet increasingly costly.

* Finally, EBS can be purchased with or without Provisioned IOPS.
* Obviously these distinctions accompany related estimating contrasts, so it merits focusing on the distinctions and utilize the least expensive that conveys the execution you require.

#### **Q188)What do you comprehend by AWS?**

Answer:This is one of the generally asked AWS engineer inquiries questions. This inquiry checks your essential AWS learning so the appropriate response ought to be clear. Amazon Web Services (AWS) is a cloud benefit stage which offers figuring power, investigation, content conveyance, database stockpiling, sending and some different administrations to help you in your business development. These administrations are profoundly versatile, solid, secure, and cheap distributed computing administrations which are plot to cooperate and, applications in this manner made are further developed and escalade.

#### **Q189)Clarify the principle components of AWS?**

Answer:The principle components of AWS are:

Highway 53: Route53 is an exceptionally versatile DNS web benefit.

Basic Storage Service (S3): S3 is most generally utilized AWS stockpiling web benefit.

Straightforward E-mail Service (SES): SES is a facilitated value-based email benefit and enables one to smoothly send deliverable messages utilizing a RESTFUL API call or through an ordinary SMTP.

Personality and Access Management (IAM): IAM gives enhanced character and security the board for AWS account.

Versatile Compute Cloud (EC2): EC2 is an AWS biological community focal piece. It is in charge of giving on-request and adaptable processing assets with a “pay as you go” estimating model.

Flexible Block Store (EBS): EBS offers consistent capacity arrangement that can be found in occurrences as a customary hard drive.

CloudWatch: CloudWatch enables the controller to viewpoint and accumulate key measurements and furthermore set a progression of cautions to be advised if there is any inconvenience.

This is among habitually asked AWS engineer inquiries questions. Simply find the questioner psyche and solution appropriately either with parts name or with the portrayal alongside.

#### **Q190)I’m not catching your meaning by AMI? What does it incorporate?**

Answer:You may run over at least one AMI related AWS engineer inquiries amid your AWS designer meet. Along these lines, set yourself up with a decent learning of AMI.

AMI represents the term Amazon Machine Image. It’s an AWS format which gives the data (an application server, and working framework, and applications) required to play out the dispatch of an occasion. This AMI is the duplicate of the AMI that is running in the cloud as a virtual server. You can dispatch occurrences from the same number of various AMIs as you require. AMI comprises of the followings:

A pull volume format for a current example

Launch authorizations to figure out which AWS records will inspire the AMI so as to dispatch the occasions

Mapping for square gadget to compute the aggregate volume that will be appended to the example at the season of dispatch

#### **Q191) Is vertically scale is conceivable on Amazon occurrence?**

Answer:Indeed, vertically scale is conceivable on Amazon example.

This is one of the normal AWS engineer inquiries questions. In the event that the questioner is hoping to find a definite solution from you, clarify the system for vertical scaling.

#### **Q192)What is the association among AMI and Instance?**

Answer:Various sorts of examples can be propelled from one AMI. The sort of an occasion for the most part manages the equipment segments of the host PC that is utilized for the case. Each kind of occurrence has unmistakable registering and memory adequacy.

When an example is propelled, it gives a role as host and the client cooperation with it is same likewise with some other PC however we have a totally controlled access to our occurrences. AWS engineer inquiries questions may contain at least one AMI based inquiries, so set yourself up for the AMI theme exceptionally well.

#### **Q193)What is the distinction between Amazon S3 and EC2?**

Answer:The contrast between Amazon S3 and EC2 is given beneath:

Amazon S3

Amazon EC2

The significance of S3 is Simple Storage Service. The importance of EC2 is Elastic Compute Cloud.

It is only an information stockpiling administration which is utilized to store huge paired files. It is a cloud web benefit which is utilized to have the application made.

It isn’t required to run a server. It is sufficient to run a server.

It has a REST interface and utilizations secure HMAC-SHA1 validation keys. It is much the same as a tremendous PC machine which can deal with application like Python, PHP, Apache and some other database.

When you are going for an AWS designer meet, set yourself up with the ideas of Amazon S3 and EC2, and the distinction between them.

#### **Q194)What number of capacity alternatives are there for EC2 Instance?**

Answer:There are four stockpiling choices for Amazon EC2 Instance:

* Amazon EBS
* Amazon EC2 Instance Store
* Amazon S3
* Adding Storage

Amazon EC2 is the basic subject you may run over while experiencing AWS engineer inquiries questions. Get a careful learning of the EC2 occurrence and all the capacity alternatives for the EC2 case.

#### **Q195)What are the security best practices for Amazon Ec2 examples?**

Answer:There are various accepted procedures for anchoring Amazon EC2 occurrences that are pertinent whether occasions are running on-preface server farms or on virtual machines. How about we view some broad prescribed procedures:

Minimum Access: Make beyond any doubt that your EC2 example has controlled access to the case and in addition to the system. Offer access specialists just to the confided in substances.

Slightest Privilege: Follow the vital guideline of minimum benefit for cases and clients to play out the capacities. Produce jobs with confined access for the occurrences.

Setup Management: Consider each EC2 occasion a design thing and use AWS arrangement the executives administrations to have a pattern for the setup of the occurrences as these administrations incorporate refreshed enemy of infection programming, security highlights and so forth.

Whatever be the activity job, you may go over security based AWS inquiries questions. Along these lines, motivate arranged with this inquiry to break the AWS designer meet.

#### **Q196)Clarify the highlights of Amazon EC2 administrations.**

Answer:Amazon EC2 administrations have following highlights:

* Virtual Computing Environments
* Proffers Persistent capacity volumes
* Firewall approving you to indicate the convention
* Pre-designed layouts
* Static IP address for dynamic Cloud Computing

#### **Q197)What is the system to send a demand to Amazon S3?**

Answer: Reply: There are 2 different ways to send a demand to Amazon S3 –

* Using REST API
* Using AWS SDK Wrapper Libraries, these wrapper libraries wrap the REST APIs for Amazon

#### **Q198)What is the default number of basins made in AWS?**

Answer**:**This is an extremely straightforward inquiry yet positions high among AWS engineer inquiries questions. Answer this inquiry straightforwardly as the default number of pails made in each AWS account is 100.

#### **Q199)What is the motivation behind T2 examples?**

Answer:T2 cases are intended for

Providing moderate gauge execution

Higher execution as required by outstanding task at hand

#### **Q200)What is the utilization of the cradle in AWS?**

Answer:This is among habitually asked AWS designer inquiries questions. Give the appropriate response in straightforward terms, the cradle is primarily used to oversee stack with the synchronization of different parts i.e. to make framework blame tolerant. Without support, segments don’t utilize any reasonable technique to get and process demands. Be that as it may, the cushion makes segments to work in a decent way and at a similar speed, hence results in quicker administrations.

#### **Q201)What happens when an Amazon EC2 occurrence is halted or ended?**

Answer:At the season of ceasing an Amazon EC2 case, a shutdown is performed in a typical way. From that point onward, the changes to the ceased state happen. Amid this, the majority of the Amazon EBS volumes are stayed joined to the case and the case can be begun whenever. The occurrence hours are not included when the occasion is the ceased state.

At the season of ending an Amazon EC2 case, a shutdown is performed in an ordinary way. Amid this, the erasure of the majority of the Amazon EBS volumes is performed. To stay away from this, the estimation of credit deleteOnTermination is set to false. On end, the occurrence additionally experiences cancellation, so the case can’t be begun once more.

#### **Q202)What are the mainstream DevOps devices?**

Answer:In an AWS DevOps Engineer talk with, this is the most widely recognized AWS inquiries for DevOps. To answer this inquiry, notice the well known DevOps apparatuses with the kind of hardware –

* Jenkins – Continuous Integration Tool
* Git – Version Control System Tool
* Nagios – Continuous Monitoring Tool
* Selenium – Continuous Testing Tool
* Docker – Containerization Tool
* Puppet, Chef, Ansible – Deployment and Configuration Administration Tools.

#### **Q203)What are IAM Roles and Policies, What is the difference between IAM Roles and Policies.**

Answer:Roles are for AWS services, Where we can assign permission of some AWS service to other Service.

Example – Giving S3 permission to EC2 to access S3 Bucket Contents.

Policies are for users and groups, Where we can assign permission to user’s and groups.

Example – Giving permission to user to access the S3 Buckets.

#### **Q204)What are the Defaults services we get when we create custom AWS VPC?**

Answer:

* Route Table
* Network ACL
* Security Group

#### **Q205)What is the Difference Between Public Subnet and Private Subnet ?**

Answer:Public Subnet will have Internet Gateway Attached to its associated Route Table and Subnet, Private Subnet will not have the Internet Gateway Attached to its associated Route Table and Subnet

Public Subnet will have internet access  and Private subnet will not have the internet access directly.

#### **Q206) How do you access the Ec2 which has private IP which is in private Subnet ?**

Answer: We can access using VPN if the VPN is configured into that Particular VPC where Ec2 is assigned to that VPC in the Subnet. We can access using other Ec2 which has the Public access.

#### **Q207)We have a custom VPC Configured and MYSQL Database server which is in Private Subnet and      we need to update the MYSQL Database Server, What are the Option to do so.**

Answer:By using NAT Gateway in the VPC or Launch a NAT Instance ( Ec2) Configure or Attach the NAT Gateway in Public Subnet ( Which has Route Table attached to IGW) and attach it to the Route Table which is Already attached to the Private Subnet.

#### **Q208) What are the Difference Between Security Groups and  Network ACL**

Answer:

|  |  |
| --- | --- |
| **Security Groups** | **Network ACL** |
| Attached to Ec2 instance | Attached to a subnet. |
| Stateful – Changes made in incoming rules is automatically applied to the outgoing rule | Stateless – Changes made in incoming rules is not applied to the outgoing rule |
| Blocking IP Address can’t be done | IP Address can be Blocked |
| Allow rules only, by default all rules are denied | Allow and Deny can be Used. |

#### **Q209)What are the Difference Between Route53 and ELB?**

Answer:Amazon Route 53 will handle DNS servers. Route 53 give you web interface through which the DNS can be managed using Route 53, it is possible to direct and failover traffic. This can be achieved by using DNS Routing Policy.

One more routing policy is Failover Routing policy. we set up a health check to monitor your application endpoints. If one of the endpoints is not available, Route 53 will automatically forward the traffic to other  endpoint.

Elastic Load Balancing

ELB automatically scales depends on the demand, so sizing of the load balancers to handle more traffic effectively when it is not required.

#### **Q210)What are the DB engines which can be used in AWS RDS?**

Answer:

* MariaDB
* MYSQL DB
* MS SQL DB
* Postgre DB
* Oracle DB

#### **Q211)What is Status Checks in AWS Ec2?**

Answer: System Status Checks – System Status checks will look into problems with instance which needs AWS help to resolve the issue. When we see system status check failure, you can wait for AWS to resolve the issue, or do it by our self.

* Network connectivity
* System power
* Software issues Data Centre’s
* Hardware issues
* Instance Status Checks – Instance Status checks will look into issues which need our involvement to fix the issue. if status check fails, we can reboot that particular instance.
* Failed system status checks
* Memory Full
* Corrupted file system
* Kernel issues

#### **Q212)To establish a peering connections between two VPC’s What condition must be met?**

Answer:

* CIDR Block should overlap
* CIDR Block should not overlap
* VPC should be in the same region
* VPC must belong to same account.
* CIDR block should not overlap between vpc setting up a peering connection . peering connection is allowed within a region , across region, across different account.

Q213) Troubleshooting with EC2 Instances:  
Answer: Instance States

* If the instance state is 0/2- there might be some hardware issue
* If the instance state is ½-there might be issue with OS.  
  Workaround-Need to restart the instance, if still that is not working logs will help to fix the issue.

Q214) How EC2instances can be resized.

Answer: EC2 instances can be resizable(scale up or scale down) based on requirement

#### **Q215) EBS: its block-level storage volume which we can use after mounting with EC2 instances.**

Answer:For types please refer AWS Solution Architect book.

#### **Q216) Difference between EBS,EFS and S3**

Answer:

* We can access EBS only if its mounted with instance, at a time EBS can be mounted only with one instance.
* EFS can be shared at a time with multiple instances
* S3 can be accessed without mounting with instances

#### **Q217) Maximum number of bucket which can be crated in AWS.**

Answer:100 buckets can be created by default in AWS account.To get more buckets additionally you have to request Amazon for that.

#### **Q218)Maximum number of EC2 which can be created in VPC.**

Answer:Maximum 20 instances can be created in a VPC. we can create 20 reserve instances and request for spot instance as per demand.

#### **Q219) How EBS can be accessed?**

Answer:**EBS**provides high performance block-level storage which can be attached with running EC2 instance. Storage can be formatted and mounted with EC2 instance, then it can be accessed.

#### **Q220)Process to mount EBS to EC2 instance**

Answer:

* Df –k
* mkfs.ext4 /dev/xvdf
* Fdisk –l
* Mkdir /my5gbdata
* Mount /dev/xvdf /my5gbdata

#### **Q221)How to add volume permanently with instance.**

Answer:With each restart volume will get unmounted from instance, to keep this attached need to perform below step

Cd /etc/fstab

/dev/xvdf /data ext4  defaults  0

0 <edit the file system name accordingly>

#### **Q222) What is the Difference between the Service Role and SAML Federated Role.**

Answer: Service Role are meant for usage of AWS Services and based upon the policies attached to it,it will have the scope to do its task. Example : In case of automation we can create a service role and attached to it.

Federated Roles are meant for User Access and getting access to AWS as per designed role. Example  : We can have a federated role created for our office employee and corresponding to that a Group will be created in the AD and user will be added to it.

#### **Q223)How many Policies can be attached to a role.**

Answer: 10 (Soft limit), We can have till 20.

#### **Q224) What are the different ways to access AWS.**

Answer:3 Different ways (CLI, Console, SDK)

#### **Q225)How a Root AWS user is different from in IAM User.**

Answer: Root User will have acces to entire AWS environment and it will not have any policy attached to it. While IAM User will be able to do its task on the basis of policies attached to it.

#### **Q226)What do you mean by Principal of least privilege in term of IAM.**

Answer: Principal of least privilege means to provide the same or equivalent permission to the user/role.

#### **Q227)What is the meaning of non-explicit deny for an IAM User.**

Answer: When an IAM user is created and it is not having any policy attached to it,in that case he will not be able to access any of the AWS Service until a policy has been attached to it.

#### **Q228) What is the precedence level between explicit allow and explicit deny.**

Answer: Explicit deny will always override Explicit Allow.

#### **Q229) What is the benefit of creating a group in IAM.**

Answer:Creation of Group makes the user management process much simpler and user with the same kind of permission can be added in a group and at last addition of a policy will be much simpler to the group in comparison to doing the same thing manually.

#### **Q230)What is the difference between the Administrative Access and Power User Access in term of pre-build policy.**

Answer: Administrative Access will have the Full access to AWS resources. While Power User Access will have the Admin access except the user/group management permission.

#### **Q231)What is the purpose of Identity Provider.**

Answer: Identity Provider helps in building the trust between the AWS and the Corporate AD environment while we create the Federated role.

#### **Q232) What are the benefits of STS (Security Token Service).**

Answer: It help in securing the AWS environment as we need not to embed or distributed the AWS Security credentials in the application. As the credentials are temporary we need not to rotate them and revoke them.

#### **Q233)What is the benefit of creating the AWS Organization.**

Answer: It helps in managing the IAM Policies, creating the AWS Accounts programmatically, helps in managing the payment methods and consolidated billing.

#### **Q234)What is the maximum file length in S3?**

Answer: utf-8 1024 bytes

#### **Q235)which activity cannot be done using autoscaling?**

Answer:Maintain fixed running of ec2

#### **Q236)How will you secure data at rest in EBS?**

Answer: EBS data is always secure

#### **Q237)What is the maximum size of S3 Bucket?**

Answer: 5TB

#### **Q238)Can objects in Amazon s3 be delivered through amazon cloud front?**

Answer:Yes

#### **Q239)which service is used to distribute content to end user service using global network of edge location?**

Answer: Virtual Private Cloud

#### **Q240)What is ephemaral storage?**

Answer: Temporary storage

#### **Q241)What are shards in kinesis aws services?**

Answer: Shards are used to store data in Kinesis.

#### **Q242)Where can you find the ephemeral storage?**

Answer: In Instance store service.

#### **Q243)I have some private servers on my premises also i have distributed some of My workload on the public cloud,what is the architecture called?**

Answer:Virtual private cloud

#### **Q244)Route 53 can be used to route users to infrastructure outside of  aws.True/false?**

Answer: False

#### **Q245)Is simple workflow service one of the valid Simple Notification Service  subscribers?**

Answer: No

#### **Q246)which cloud model do Developers and organizations all around the world leverage extensively?**

Answer: IAAS-Infrastructure as a service.

#### **Q247)Can cloud front serve content from a non AWS origin server?**

Answer: No

#### **Q248)Is EFS a centralised storage service in AWS?**

Answer: Yes

#### **Q249)Which AWS service will you use to collect and process ecommerce data for near real time analysis?**

Answer: Both Dynamo DB & Redshift

#### **Q250)An high demand of IOPS performance is expected around 15000.Which EBS volume type would you recommend?**

Answer:  Provisioned IOPS.

## Section 1: What is Cloud Computing. Can you talk about and compare any two popular Cloud Service Providers?

For a detailed discussion on this topic, please refer our [**Cloud Computing**](https://www.edureka.co/blog/what-is-cloud-computing/) blog. Following is the comparison between two of the most popular Cloud Service Providers:

**Amazon Web Services Vs Microsoft Azure**

|  |  |  |
| --- | --- | --- |
| **Parameters** | **AWS** | **Azure** |
| **Initiation** | 2006 | 2010 |
| **Market Share** | 4x | x |
| **Implementation** | Less Options | More Experimentation Possible |
| **Features** | Widest Range Of Options | Good Range Of Options |
| **App Hosting** | AWS not as good as Azure | Azure Is Better |
| **Development** | Varied & Great Features | Varied & Great Features |
| **IaaS Offerings** | Good Market Hold | Better Offerings than AWS |

### 1. ****Try this AWS scenario based interview question.****I have some private servers on my premises, also I have distributed some of my workload on the public cloud, what is this architecture called?

1. Virtual Private Network
2. Private Cloud
3. Virtual Private Cloud
4. Hybrid Cloud

**Answer D.**

**Explanation:**This type of architecture would be a hybrid cloud. Why? Because we are using both, the public cloud, and your on premises servers i.e the private cloud. To make this hybrid architecture easy to use, wouldn’t it be better if your private and public cloud were all on the same network(virtually). This is established by including your public cloud servers in a virtual private cloud, and connecting this virtual cloud with your on premise servers using a VPN(Virtual Private Network).

## Section 2: Amazon EC2 Interview Questions

For a detailed discussion on this topic, please refer our [**EC2 AWS**](https://www.edureka.co/blog/ec2-aws-tutorial-elastic-compute-cloud/) blog.

### 2. What does the following command do with respect to the Amazon EC2 security groups?

**ec2-create-group CreateSecurityGroup**

1. Groups the user created security groups into a new group for easy access.
2. Creates a new security group for use with your account.
3. Creates a new group inside the security group.
4. Creates a new rule inside the security group.

**Answer B.**

**Explanation:**A Security group is just like a firewall, it controls the traffic in and out of your instance. In AWS terms, the inbound and outbound traffic. The command mentioned is pretty straight forward, it says create security group, and does the same. Moving along, once your security group is created, you can add different rules in it. For example, you have an RDS instance, to access it, you have to add the public IP address of the machine from which you want access the instance  in its security group.

### ****3. Here is aws scenario based interview question. You have a video trans-coding application. The videos are processed according to a queue. If the processing of a video is interrupted in one instance, it is resumed in another instance. Currently there is a huge back-log of videos which needs to be processed, for this you need to add more instances, but you need these instances only until your backlog is reduced. Which of these would be an efficient way to do it?****

You should be using an **On Demand** instance for the same. Why? First of all, the workload has to be processed now, meaning it is urgent, secondly you don’t need them once your backlog is cleared, therefore Reserved Instance is out of the picture, and since the work is urgent, you cannot stop the work on your instance just because the spot price spiked, therefore Spot Instances shall also not be used. Hence On-Demand instances shall be the right choice in this case.

### 4. You have a distributed application that periodically processes large volumes of data across multiple Amazon EC2 Instances. The application is designed to recover gracefully from Amazon EC2 instance failures. You are required to accomplish this task in the most cost effective way.

**Which of the following will meet your requirements?**

1. Spot Instances
2. Reserved instances
3. Dedicated instances
4. On-Demand instances

**Answer: A**

**Explanation:**Since the work we are addressing here is not continuous, a reserved instance shall be idle at times, same goes with On Demand instances. Also it does not make sense to launch an On Demand instance whenever work comes up, since it is expensive. Hence Spot Instances will be the right fit because of their low rates and no long term commitments.

### ****5. How is stopping and terminating an instance different from each other?****

Starting, stopping and terminating are the three states in an EC2 instance, let’s discuss them in detail:

* **Stopping and Starting** an instance: When an instance is stopped, the instance performs a normal shutdown and then transitions to a stopped state. All of its Amazon EBS volumes remain attached, and you can start the instance again at a later time. You are not charged for additional instance hours while the instance is in a stopped state.
* **Terminating** an instance: When an instance is terminated, the instance performs a normal shutdown, then the attached Amazon EBS volumes are deleted unless the volume’s *deleteOnTermination* attribute is set to false. The instance itself is also deleted, and you can’t start the instance again at a later time.

### ****6. If I want my instance to run on a single-tenant hardware, which value do I have to set the instance’s tenancy attribute to?****

1. Dedicated
2. Isolated
3. One
4. Reserved

**Answer A.**

**Explanation:**The Instance tenancy attribute should be set to Dedicated Instance. The rest of the values are invalid.

### 7. When will you incur costs with an Elastic IP address (EIP)?

1. When an EIP is allocated.
2. When it is allocated and associated with a running instance.
3. When it is allocated and associated with a stopped instance.
4. Costs are incurred regardless of whether the EIP is associated with a running instance.

**Answer C.**

**Explanation:**You are not charged, if only one Elastic IP address is attached with your running instance. But you do get charged in the following conditions:

* When you use more than one Elastic IPs with your instance.
* When your Elastic IP is attached to a stopped instance.
* When your Elastic IP is not attached to any instance.

### ****8. How is a Spot instance different from an On-Demand instance or Reserved Instance?****

First of all, let’s understand that Spot Instance, On-Demand instance and Reserved Instances are all models for pricing. Moving along, spot instances provide the ability for customers to purchase compute capacity with no upfront commitment, at hourly rates usually lower than the On-Demand rate in each region. Spot instances are just like bidding, the bidding price is called Spot Price. The Spot Price fluctuates based on supply and demand for instances, but customers will never pay more than the maximum price they have specified. If the Spot Price moves higher than a customer’s maximum price, the customer’s EC2 instance will be shut down automatically. But the reverse is not true, if the Spot prices come down again, your EC2 instance will not be launched automatically, one has to do that manually.  In Spot and On demand instance, there is no commitment for the duration from the user side, however in reserved instances one has to stick to the time period that he has chosen.

### ****9. Are the Reserved Instances available for Multi-AZ Deployments?****

1. Multi-AZ Deployments are only available for Cluster Compute instances types
2. Available for all instance types
3. Only available for M3 instance types
4. D. Not Available for Reserved Instances

**Answer B.**

**Explanation:** Reserved Instances is a pricing model, which is available for all instance types in EC2.

### ****10. How to use the processor state control feature available on the  c4.8xlarge instance?****

The processor state control consists of 2 states:

* The C state – Sleep state varying from c0 to c6. C6 being the deepest sleep state for a processor
* The P state – Performance state p0 being the highest and p15 being the lowest possible frequency.

Now, why the C state and P state. Processors have cores, these cores need thermal headroom to boost their performance. Now since all the cores are on the processor the temperature should be kept at an optimal state so that all the cores can perform at the highest performance.

Now how will these states help in that? If a core is put into sleep state it will reduce the overall temperature of the processor and hence other cores can perform better. Now the same can be  synchronized with other cores, so that the processor can boost as many cores it can by timely putting other cores to sleep, and thus get an overall performance boost.

Concluding, the C and P state can be customized in some EC2 instances like the c4.8xlarge instance and thus you can customize the processor according to your workload.

How to do it? You can refer this [tutorial](http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/processor_state_control.html) for the same.

### ****11. What kind of network performance parameters can you expect when you launch instances in cluster placement group?****

The network performance depends on the instance type and network performance specification, if launched in a placement group you can expect up to

* 10 Gbps in a single-flow,
* 20 Gbps in multiflow i.e full duplex
* Network traffic outside the placement group will be limited to 5 Gbps(full duplex).

### 12. To deploy a 4 node cluster of Hadoop in AWS which instance type can be used?

First let’s understand what actually happens in a Hadoop cluster, the Hadoop cluster follows a master slave concept. The master machine processes all the data, slave machines store the data and act as data nodes. Since all the storage happens at the slave, a higher capacity hard disk would be recommended and since master does all the processing, a higher RAM and a much better CPU is required. Therefore, you can select the configuration of your machine depending on your workload. For e.g. – In this case c4.8xlarge will be preferred for master machine whereas for slave machine we can select i2.large instance. If you don’t want to deal with configuring your instance and installing hadoop cluster manually, you can straight away launch an Amazon EMR (Elastic Map Reduce) instance which automatically configures the servers for you. You dump your data to be processed in S3, EMR picks it from there, processes it, and dumps it back into S3.

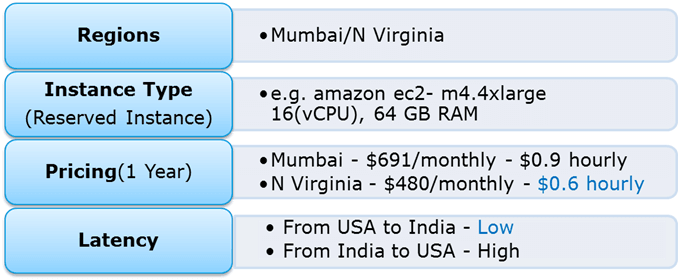
### 13. Where do you think an AMI fits, when you are designing an architecture for a solution?

AMIs(Amazon Machine Images) are like templates of virtual machines and an instance is derived from an AMI. AWS offers pre-baked AMIs which you can choose while you are launching an instance, some AMIs are not free, therefore can be bought from the AWS Marketplace. You can also choose to create your own custom AMI which would help you save space on AWS. For example if you don’t need a set of software on your installation, you can customize your AMI to do that. This makes it cost efficient, since you are removing the unwanted things.

### 14. How do you choose an Availability Zone?

Let’s understand this through an example, consider there’s a company which has user base in India as well as in the US.

Let us see how we will choose the region for this use case :



So, with reference to the above figure the regions to choose between are, Mumbai and North Virginia. Now let us first compare the pricing, you have hourly prices, which can be converted to your per month figure. Here North Virginia emerges as a winner. But, pricing cannot be the only parameter to consider. Performance should also be kept in mind hence, let’s look at latency as well. Latency basically is the time that a server takes to respond to your requests i.e the response time. North Virginia wins again!

So concluding, North Virginia should be chosen for this use case.

### 15. Is one Elastic IP address enough for every instance that I have running?

Depends! Every instance comes with its own private and public address. The private address is associated exclusively with the instance and is returned  to Amazon EC2 only when it is stopped or terminated. Similarly, the public address is associated exclusively with the instance until it is stopped or terminated. However, this can be replaced by the Elastic IP address, which stays with the instance as long as the user doesn’t manually detach it. But what if you are hosting multiple websites on your EC2 server, in that case you may require more than one Elastic IP address.

### 16. What are the best practices for Security in Amazon EC2?

There are several best practices to secure Amazon EC2. A few of them are given below:

* Use AWS Identity and Access Management (IAM) to control access to your AWS resources.
* Restrict access by only allowing trusted hosts or networks to access ports on your instance.
* Review the rules in your security groups regularly, and ensure that you apply the principle of least
* Privilege – only open up permissions that you require.
* Disable password-based logins for instances launched from your AMI. Passwords can be found or cracked, and are a security risk.

## Section 3: Amazon Storage

### 17. ****Another scenario based interview question.****You need to configure an Amazon S3 bucket to serve static assets for your public-facing web application. Which method will ensure that all objects uploaded to the bucket are set to public read?

1. Set permissions on the object to public read during upload.
2. Configure the bucket policy to set all objects to public read.
3. Use AWS Identity and Access Management roles to set the bucket to public read.
4. Amazon S3 objects default to public read, so no action is needed.

**Answer B.**

**Explanation:** Rather than making changes to every object, its better to set the policy for the whole bucket. IAM is used to give more granular permissions, since this is a website, all objects would be public by default.

### 18. A customer wants to leverage Amazon Simple Storage Service (S3) and Amazon Glacier as part of their backup and archive infrastructure. The customer plans to use third-party software to support this integration. Which approach will limit the access of the third party software to only the Amazon S3 bucket named “company-backup”?

1. A custom bucket policy limited to the Amazon S3 API in three Amazon Glacier archive “company-backup”
2. A custom bucket policy limited to the Amazon S3 API in “company-backup”
3. A custom IAM user policy limited to the Amazon S3 API for the Amazon Glacier archive “company-backup”.
4. A custom IAM user policy limited to the Amazon S3 API in “company-backup”.

**Answer D.**

**Explanation:** Taking queue from the previous questions, this use case involves more granular permissions, hence IAM would be used here.

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### ****19. Can S3 be used with EC2 instances, if yes, how?****

Yes, it can be used for instances with root devices backed by local instance storage. By using Amazon S3, developers have access to the same highly scalable, reliable, fast, inexpensive data storage infrastructure that Amazon uses to run its own global network of web sites. In order to execute systems in the Amazon EC2 environment, developers use the tools provided to load their Amazon Machine Images (AMIs) into Amazon S3 and to move them between Amazon S3 and Amazon EC2.

Another use case could be for websites hosted on EC2 to load their static content from S3.

For a detailed discussion on S3, please refer our [**S3 AWS**](https://www.edureka.co/blog/s3-aws-amazon-simple-storage-service/)blog.

### 20. A customer implemented AWS Storage Gateway with a gateway-cached volume at their main office. An event takes the link between the main and branch office offline. Which methods will enable the branch office to access their data?

1. Restore by implementing a lifecycle policy on the Amazon S3 bucket.
2. Make an Amazon Glacier Restore API call to load the files into another Amazon S3 bucket within four to six hours.
3. Launch a new AWS Storage Gateway instance AMI in Amazon EC2, and restore from a gateway snapshot.
4. Create an Amazon EBS volume from a gateway snapshot, and mount it to an Amazon EC2 instance.

**Answer C.**

**Explanation:**The fastest way to do it would be launching a new storage gateway instance. Why? Since time is the key factor which drives every business, troubleshooting this problem will take more time. Rather than we can just restore the previous working state of the storage gateway on a new instance.

### 21. When you need to move data over long distances using the internet, for instance across countries or continents to your Amazon S3 bucket, which method or service will you use?

1. Amazon Glacier
2. Amazon CloudFront
3. Amazon Transfer Acceleration
4. Amazon Snowball

**Answer C.**

**Explanation:** You would not use Snowball, because for now, the snowball service does not support cross region data transfer, and since, we are transferring across countries, Snowball cannot be used. Transfer Acceleration shall be the right choice here as it throttles your data transfer with the use of optimized network paths and Amazon’s content delivery network upto 300% compared to normal data transfer speed.

### 22. How can you speed up data transfer in Snowball?

The data transfer can be increased in the following way:

* By performing multiple copy operations at one time i.e. if the workstation is powerful enough, you can initiate multiple cp commands each from different terminals, on the same Snowball device.
* Copying from multiple workstations to the same snowball.
* Transferring large files or by creating a batch of small file, this will reduce the encryption overhead.
* Eliminating unnecessary hops i.e. make a setup where the source machine(s) and the snowball are the only machines active on the switch being used, this can hugely improve performance.

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## Section 4: AWS VPC

### 23. If you want to launch Amazon Elastic Compute Cloud (EC2) instances and assign each instance a predetermined private IP address you should:

1. Launch the instance from a private Amazon Machine Image (AMI).
2. Assign a group of sequential Elastic IP address to the instances.
3. Launch the instances in the Amazon Virtual Private Cloud (VPC).
4. Launch the instances in a Placement Group.

**Answer C.**

**Explanation:** The best way of connecting to your cloud resources (for ex- ec2 instances) from your own data center (for eg- private cloud) is a VPC. Once you connect your datacenter to the VPC in which your instances are present, each instance is assigned a private IP address which can be accessed from your datacenter. Hence, you can access your public cloud resources, as if they were on your own network.

### ****24. Can I connect my corporate datacenter to the Amazon Cloud?****

Yes, you can do this by establishing a VPN(Virtual Private Network) connection between your company’s network and your VPC (Virtual Private Cloud), this will allow you to interact with your EC2 instances as if they were within your existing network.

### ****25. Is it possible to change the private IP addresses of an EC2 while it is running/stopped in a VPC?****

Primary private IP address is attached with the instance throughout its lifetime and cannot be changed, however secondary private addresses can be unassigned, assigned or moved between interfaces or instances at any point.

### 26. Why do you make subnets?

1. Because there is a shortage of networks
2. To efficiently utilize networks that have a large no. of hosts.
3. Because there is a shortage of hosts.
4. To efficiently utilize networks that have a small no. of hosts.

**Answer B.**

**Explanation:**If there is a network which has a large no. of hosts, managing all these hosts can be a tedious job. Therefore we divide this network into subnets (sub-networks) so that managing these hosts becomes simpler.

### 27. Which of the following is true?

1. You can attach multiple route tables to a subnet
2. You can attach multiple subnets to a route table
3. Both A and B
4. None of these.

**Answer B.**

**Explanation:**Route Tables are used to route network packets, therefore in a subnet having multiple route tables will lead to confusion as to where the packet has to go. Therefore, there is only one route table in a subnet, and since a route table can have any no. of records or information, hence attaching multiple subnets to a route table is possible.

### 28. In CloudFront what happens when content is NOT present at an Edge location and a request is made to it?

1. An Error “404 not found” is returned
2. CloudFront delivers the content directly from the origin server and stores it in the cache of the edge location
3. The request is kept on hold till content is delivered to the edge location
4. The request is routed to the next closest edge location

**Answer B.**

**Explanation:** CloudFront is a content delivery system, which caches data to the nearest edge location from the user, to reduce latency. If data is not present at an edge location, the first time the data may get transferred from the original server, but from the next time, it will be served from the cached edge.

### 29. If I’m using Amazon CloudFront, can I use Direct Connect to transfer objects from my own data center?

Yes. Amazon CloudFront supports custom origins including origins from outside of AWS. With AWS Direct Connect, you will be charged with the respective data transfer rates.

### ****30. If my AWS Direct Connect fails, will I lose my connectivity?****

If a backup AWS Direct connect has been configured, in the event of a failure it will switch over to the second one. It is recommended to enable Bidirectional Forwarding Detection (BFD) when configuring your connections to ensure faster detection and failover. On the other hand, if you have configured a backup IPsec VPN connection instead, all VPC traffic will failover to the backup VPN connection automatically. Traffic to/from public resources such as Amazon S3 will be routed over the Internet. If you do not have a backup AWS Direct Connect link or a IPsec VPN link, then Amazon VPC traffic will be dropped in the event of a failure.

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## Section 5: Amazon Database

### 31. If I launch a standby RDS instance, will it be in the same Availability Zone as my primary?

1. Only for Oracle RDS types
2. Yes
3. Only if it is configured at launch
4. No

**Answer D.**

**Explanation:**No, since the purpose of having a standby instance is to avoid an infrastructure failure (if it happens), therefore the standby instance is stored in a different availability zone, which is a physically different independent infrastructure.

### 32. When would I prefer Provisioned IOPS over Standard RDS storage?

1. **If you have batch-oriented workloads**
2. If you use production online transaction processing (OLTP) workloads.
3. If you have workloads that are not sensitive to consistent performance
4. All of the above

**Answer A.**

**Explanation:** Provisioned IOPS deliver high IO rates but on the other hand it is expensive as well. Batch processing workloads do not require manual intervention they enable full utilization of systems, therefore a provisioned IOPS will be preferred for batch oriented workload.

### ****33. How is Amazon RDS, DynamoDB and Redshift different?****

* Amazon RDS is a database management service for relational databases,  it manages patching, upgrading, backing up of data etc. of databases for you without your intervention. RDS  is a Db management service for structured data only.
* DynamoDB, on the other hand, is a NoSQL database service, NoSQL deals with unstructured data.
* Redshift, is an entirely different service, it is a data warehouse product and is used in data analysis.

### 34. If I am running my DB Instance as a Multi-AZ deployment, can I use the standby DB Instance for read or write operations along with primary DB instance?

1. Yes
2. Only with MySQL based RDS
3. Only for Oracle RDS instances
4. No

**Answer D.**

**Explanation:**No,Standby DB instance cannot be used with primary DB instance in parallel, as the former is solely used for standby purposes, it cannot be used unless the primary instance goes down.

### 35. Your company’s branch offices are all over the world, they use a software with a multi-regional deployment on AWS, they use MySQL 5.6 for data persistence.

**The task is to run an hourly batch process and read data from every region to compute cross-regional reports which will be distributed to all the branches. This should be done in the shortest time possible. How will you build the DB architecture in order to meet the requirements?**

1. For each regional deployment, use RDS MySQL with a master in the region and a read replica in the HQ region
2. For each regional deployment, use MySQL on EC2 with a master in the region and send hourly EBS snapshots to the HQ region
3. For each regional deployment, use RDS MySQL with a master in the region and send hourly RDS snapshots to the HQ region
4. For each regional deployment, use MySQL on EC2 with a master in the region and use S3 to copy data files hourly to the HQ region

**Answer A.**

**Explanation:**For this we will take an RDS instance as a master, because it will manage our database for us and since we have to read from every region, we’ll put a read replica of this instance in every region where the data has to be read from. Option C is not correct since putting a read replica would be more efficient than putting a snapshot, a read replica can be promoted if needed  to an independent DB instance, but with a Db snapshot it becomes mandatory to launch a separate DB Instance.

### ****36. Can I run more than one DB instance for Amazon RDS for free?****

Yes. You can run more than one Single-AZ Micro database instance, that too for free! However, any use exceeding 750 instance hours, across all Amazon RDS Single-AZ Micro DB instances, across all eligible database engines and regions, will be billed at standard Amazon RDS prices. For example: if you run two Single-AZ Micro DB instances for 400 hours each in a single month, you will accumulate 800 instance hours of usage, of which 750 hours will be free. You will be billed for the remaining 50 hours at the standard Amazon RDS price.

For a detailed discussion on this topic, please refer our[**RDS AWS**](https://www.edureka.co/blog/rds-aws-tutorial/) blog.

### 37. Which AWS services will you use to collect and process e-commerce data for near real-time analysis?

1. Amazon ElastiCache
2. Amazon DynamoDB
3. Amazon Redshift
4. Amazon Elastic MapReduce

**Answer B,C.**

**Explanation:** DynamoDB is a fully managed NoSQL database service. DynamoDB, therefore can be fed any type of unstructured data, which can be data from e-commerce websites as well, and later, an analysis can be done on them using Amazon Redshift. We are not using Elastic MapReduce, since a near real time analyses is needed.

### ****38. Can I retrieve only a specific element of the data, if I have a nested JSON data in DynamoDB?****

Yes. When using the GetItem, BatchGetItem, Query or Scan APIs, you can define a Projection Expression to determine which attributes should be retrieved from the table. Those attributes can include scalars, sets, or elements of a JSON document.

### 39. A company is deploying a new two-tier web application in AWS. The company has limited staff and requires high availability, and the application requires complex queries and table joins. Which configuration provides the solution for the company’s requirements?

1. MySQL Installed on two Amazon EC2 Instances in a single Availability Zone
2. Amazon RDS for MySQL with Multi-AZ
3. Amazon ElastiCache
4. Amazon DynamoDB

**Answer D.**

**Explanation:**DynamoDB has the ability to scale more than RDS or any other relational database service, therefore DynamoDB would be the apt choice.

### 40. What happens to my backups and DB Snapshots if I delete my DB Instance?

When you delete a DB instance, you have an option of creating a final DB snapshot, if you do that you can restore your database from that snapshot. RDS retains this user-created DB snapshot along with all other manually created DB snapshots after the instance is deleted, also automated backups are deleted and only manually created DB Snapshots are retained.

### 41. Which of the following use cases are suitable for Amazon DynamoDB? Choose 2 answers

1. Managing web sessions.
2. Storing JSON documents.
3. Storing metadata for Amazon S3 objects.
4. Running relational joins and complex updates.

**Answer C,D.**

**Explanation:**If all your JSON data have the same fields eg [id,name,age] then it would be better to store it in a relational database, the metadata on the other hand is unstructured, also running relational joins or complex updates would work on DynamoDB as well.

### ****42. How can I load my data to Amazon Redshift from different data sources like Amazon RDS, Amazon DynamoDB and Amazon EC2?****

You can load the data in the following two ways:

* You can use the COPY command to load data in parallel directly to Amazon Redshift from Amazon EMR, Amazon DynamoDB, or any SSH-enabled host.
* AWS Data Pipeline provides a high performance, reliable, fault tolerant solution to load data from a variety of AWS data sources. You can use AWS Data Pipeline to specify the data source, desired data transformations, and then execute a pre-written import script to load your data into Amazon Redshift.

### 43. Your application has to retrieve data from your user’s mobile every 5 minutes and the data is stored in DynamoDB, later every day at a particular time the data is extracted into S3 on a per user basis and then your application is later used to visualize the data to the user. You are asked to optimize the architecture of the backend system to lower cost, what would you recommend?

1. Create a new Amazon DynamoDB (able each day and drop the one for the previous day after its data is on Amazon S3.
2. Introduce an Amazon SQS queue to buffer writes to the Amazon DynamoDB table and reduce provisioned write throughput.
3. Introduce Amazon Elasticache to cache reads from the Amazon DynamoDB table and reduce provisioned read throughput.
4. Write data directly into an Amazon Redshift cluster replacing both Amazon DynamoDB and Amazon S3.

**Answer C.**

**Explanation:**Since our work requires the data to be extracted and analyzed, to optimize this process a person would use provisioned IO, but since it is expensive, using a ElastiCache memoryinsread to cache the results in the memory can reduce the provisioned read throughput and hence reduce cost without affecting the performance.

### 44. You are running a website on EC2 instances deployed across multiple Availability Zones with a Multi-AZ RDS MySQL Extra Large DB Instance. The site performs a high number of small reads and writes per second and relies on an eventual consistency model. After comprehensive tests you discover that there is read contention on RDS MySQL. Which are the best approaches to meet these requirements? (Choose 2 answers)

1. Deploy ElastiCache in-memory cache running in each availability zone
2. Implement sharding to distribute load to multiple RDS MySQL instances
3. Increase the RDS MySQL Instance size and Implement provisioned IOPS
4. Add an RDS MySQL read replica in each availability zone

**Answer A,C.**

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**Explanation:**Since it does a lot of read writes, provisioned IO may become expensive. But we need high performance as well, therefore the data can be cached using ElastiCache which can be used for frequently reading the data. As for RDS since read contention is happening, the instance size should be increased and provisioned IO should be introduced to increase the performance.

### 45. A startup is running a pilot deployment of around 100 sensors to measure street noise and air quality in urban areas for 3 months. It was noted that every month around 4GB of sensor data is generated. The company uses a load balanced auto scaled layer of EC2 instances and a RDS database with 500 GB standard storage. The pilot was a success and now they want to deploy at least  100K sensors which need to be supported by the backend. You need to store the data for at least 2 years to analyze it. Which setup of the following would you prefer?

1. Add an SQS queue to the ingestion layer to buffer writes to the RDS instance
2. Ingest data into a DynamoDB table and move old data to a Redshift cluster
3. Replace the RDS instance with a 6 node Redshift cluster with 96TB of storage
4. Keep the current architecture but upgrade RDS storage to 3TB and 10K provisioned IOPS

**Answer C.**  
**Explanation:**A Redshift cluster would be preferred because it easy to scale, also the work would be done in parallel through the nodes, therefore is perfect for a bigger workload like our use case.Since each month 4 GB of data is generated, therefore in 2 year, it should be around 96 GB. And since the servers will be increased to 100K in number, 96 GB will approximately become 96TB. Hence option C is the right answer.

## Section 6: AWS Auto Scaling, AWS Load Balancer

### 46. Suppose you have an application where you have to render images and also do some general computing. From the following  services which service will best fit your need?

1. Classic Load Balancer
2. Application Load Balancer
3. Both of them
4. None of these

**Answer B.**

**Explanation:**You will choose an application load balancer, since it supports path based routing, which means it can take decisions based on the URL, therefore if your task needs image rendering it will route it to a different instance, and for general computing it will route it to a different instance.

### 47. What is the difference between Scalability and Elasticity?

Scalability is the ability of a system to increase its hardware resources to handle the increase in demand. It can be done by increasing the hardware specifications or increasing the processing nodes.

Elasticity is the ability of a system to handle increase in the workload by adding additional hardware resources when the demand increases(same as scaling) but also rolling back the scaled resources, when the resources are no longer needed. This is particularly helpful in Cloud environments, where a pay per use model is followed.

### 48. How will you change the instance type for instances which are running in your application tier and are using Auto Scaling. Where will you change it from the following areas?

1. Auto Scaling policy configuration
2. Auto Scaling group
3. Auto Scaling tags configuration
4. Auto Scaling launch configuration

**Answer D.**

**Explanation:**Auto scaling tags configuration, is used to attach metadata to your instances, to change the instance type you have to use auto scaling launch configuration.

### 49. You have a content management system running on an Amazon EC2 instance that is approaching 100% CPU utilization. Which option will reduce load on the Amazon EC2 instance?

1. Create a load balancer, and register the Amazon EC2 instance with it
2. Create a CloudFront distribution, and configure the Amazon EC2 instance as the origin
3. Create an Auto Scaling group from the instance using the CreateAutoScalingGroup action
4. Create a launch configuration from the instance using the CreateLaunchConfigurationAction

**Answer A.**

**Explanation:**Creating alone an autoscaling group will not solve the issue, until you attach a load balancer to it. Once you attach a load balancer to an autoscaling group, it will efficiently distribute the load among all the instances. Option B – CloudFront is a CDN, it is a data transfer tool therefore will not help reduce load on the EC2 instance. Similarly the other option – Launch configuration is a template for configuration which has no connection with reducing loads.

### 50. When should I use a Classic Load Balancer and when should I use an Application load balancer?

A Classic Load Balancer is ideal for simple load balancing of traffic across multiple EC2 instances, while an Application Load Balancer is ideal for microservices or container-based architectures where there is a need to route traffic to multiple services or load balance across multiple ports on the same EC2 instance.

For a detailed discussion on Auto Scaling and Load Balancer, please refer our [**EC2 AWS**](https://www.edureka.co/blog/ec2-aws-tutorial-elastic-compute-cloud/) blog.

### 51. What does Connection draining do?

1. Terminates instances which are not in use.
2. **Re-routes traffic from instances which are to be updated or failed a health check.**
3. Re-routes traffic from instances which have more workload to instances which have less workload.
4. Drains all the connections from an instance, with one click.

**Answer B.**

**Explanation:**Connection draining is a service under ELB which constantly monitors the health of the instances. If any instance fails a health check or if any instance has to be patched with a software update, it  pulls all the traffic from that instance and re routes them to other instances.

### 52. When an instance is unhealthy, it is terminated and replaced with a new one, which of the following services does that?

1. Sticky Sessions
2. Fault Tolerance
3. Connection Draining
4. Monitoring

**Answer B.**

**Explanation:**When ELB detects that an instance is unhealthy, it starts routing incoming traffic to other healthy instances in the region. If all the instances in a region becomes unhealthy, and if you have instances in some other availability zone/region, your traffic is directed to them. Once your instances become healthy again, they are re routed back to the original instances.

### 53. What are lifecycle hooks used for in AutoScaling?

1. They are used to do health checks on instances
2. They are used to put an additional wait time to a scale in or scale out event.
3. They are used to shorten the wait time to a scale in or scale out event
4. None of these

**Answer B.**

**Explanation:**Lifecycle hooks are used for putting wait time before any lifecycle action i.e launching or terminating an instance happens. The purpose of this wait time, can be anything from extracting log files before terminating an instance or installing the necessary softwares in an instance before launching it.

### ****54. A user has setup an Auto Scaling group. Due to some issue the group has failed to launch a single instance for more than 24 hours. What will happen to Auto Scaling in this condition?****

1. Auto Scaling will keep trying to launch the instance for 72 hours
2. Auto Scaling will suspend the scaling process
3. Auto Scaling will start an instance in a separate region
4. The Auto Scaling group will be terminated automatically

**Answer B.**

**Explanation:** Auto Scaling allows you to suspend and then resume one or more of the Auto Scaling processes in your Auto Scaling group. This can be very useful when you want to investigate a configuration problem or other issue with your web application, and then make changes to your application, without triggering the Auto Scaling process.

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## Section 7: CloudTrail, Route 53

### 55. You have an EC2 Security Group with several running EC2 instances. You changed the Security Group rules to allow inbound traffic on a new port and protocol, and then launched several new instances in the same Security Group. The new rules apply:

1. Immediately to all instances in the security group.
2. Immediately to the new instances only.
3. Immediately to the new instances, but old instances must be stopped and restarted before the new rules apply.
4. To all instances, but it may take several minutes for old instances to see the changes.

**Answer A.**

**Explanation:** Any rule specified in an EC2 Security Group applies immediately to all the instances, irrespective of when they are launched before or after adding a rule.

### 56. To create a mirror image of your environment in another region for disaster recovery, which of the following AWS resources do not need to be recreated in the second region? ( Choose 2 answers )

1. Route 53 Record Sets
2. Elastic IP Addresses (EIP)
3. EC2 Key Pairs
4. Launch configurations
5. Security Groups

**Answer A.**

**Explanation:**Route 53 record sets are common assets therefore there is no need to replicate them, since Route 53 is valid across regions

### 57. A customer wants to capture all client connection information from his load balancer at an interval of 5 minutes, which of the following options should he choose for his application?

1. Enable AWS CloudTrail for the loadbalancer.
2. Enable access logs on the load balancer.
3. Install the Amazon CloudWatch Logs agent on the load balancer.
4. Enable Amazon CloudWatch metrics on the load balancer.

**Answer A.**

**Explanation:**AWS CloudTrail provides inexpensive logging information for load balancer and other AWS resources This logging information can be used for analyses and other administrative work, therefore is perfect for this use case.

### 58. A customer wants to track access to their Amazon Simple Storage Service (S3) buckets and also use this information for their internal security and access audits. Which of the following will meet the Customer requirement?

1. Enable AWS CloudTrail to audit all Amazon S3 bucket access.
2. Enable server access logging for all required Amazon S3 buckets.
3. Enable the Requester Pays option to track access via AWS Billing
4. Enable Amazon S3 event notifications for Put and Post.

**Answer A.**

**Explanation:**AWS CloudTrail has been designed for logging and tracking API calls. Also this service is available for storage, therefore should be used in this use case.

### 59. Which of the following are true regarding AWS CloudTrail? (Choose 2 answers)

1. CloudTrail is enabled globally
2. CloudTrail is enabled on a per-region and service basis
3. Logs can be delivered to a single Amazon S3 bucket for aggregation.
4. CloudTrail is enabled for all available services within a region.

**Answer B,C.**

**Explanation:** Cloudtrail is not enabled for all the services and is also not available for all the regions. Therefore option B is correct, also the logs can be delivered to your S3 bucket, hence C is also correct.

### ****60. What happens if CloudTrail is turned on for my account but my Amazon S3 bucket is not configured with the correct policy?****

CloudTrail files are delivered according to S3 bucket policies. If the bucket is not configured or is misconfigured, CloudTrail might not be able to deliver the log files.

### ****61. How do I transfer my existing domain name registration to Amazon Route 53 without disrupting my existing web traffic?****

You will need to get a list of the DNS record data for your domain name first, it is generally available in the form of a “zone file” that you can get from your existing DNS provider. Once you receive the DNS record data, you can use Route 53’s Management Console or simple web-services interface to create a hosted zone that will store your DNS records for your domain name and follow its transfer process. It also includes steps such as updating the nameservers for your domain name to the ones associated with your hosted zone. For completing the process you have to contact the registrar with whom you registered your domain name and follow the transfer process. As soon as your registrar propagates the new name server delegations, your DNS queries will start to get answered.

## Section 8: AWS SQS, AWS SNS, AWS SES, AWS ElasticBeanstalk

### 62. Which of the following services you would not use to deploy an app?

1. Elastic Beanstalk
2. Lambda
3. Opsworks
4. CloudFormation

**Answer B.**

**Explanation:** Lambda is used for running server-less applications. It can be used to deploy functions triggered by events. When we say serverless, we mean without you worrying about the computing resources running in the background. It is not designed for creating applications which are publicly accessed.

### 63. How does Elastic Beanstalk apply updates?

1. By having a duplicate ready with updates before swapping.
2. By updating on the instance while it is running
3. By taking the instance down in the maintenance window
4. Updates should be installed manually

**Answer A.**

**Explanation:** Elastic Beanstalk prepares a duplicate copy of the instance, before updating the original instance, and routes your traffic to the duplicate instance, so that, incase your updated application fails, it will switch back to the original instance, and there will be no downtime experienced by the users who are using your application.

### ****64. How is AWS Elastic Beanstalk different than AWS OpsWorks?****

AWS Elastic Beanstalk is an application management platform while OpsWorks is a configuration management platform. BeanStalk is an easy to use service which is used for deploying and scaling web applications developed with Java, .Net, PHP, Node.js, Python, Ruby, Go and Docker. Customers upload their code and Elastic Beanstalk automatically handles the deployment. The application will be ready to use without any infrastructure or resource configuration.

In contrast, AWS Opsworks is an integrated configuration management platform for IT administrators or DevOps engineers who want a high degree of customization and control over operations.

### 65. What happens if my application stops responding to requests in beanstalk?

AWS Beanstalk applications have a system in place for avoiding failures in the underlying infrastructure. If an Amazon EC2 instance fails for any reason, Beanstalk will use Auto Scaling to automatically launch a new instance. Beanstalk can also detect if your application is not responding on the custom link, even though the infrastructure appears healthy, it will be logged as an environmental event( e.g a bad version was deployed) so you can take an appropriate action.

For a detailed discussion on this topic, please refer [**Lambda AWS**](https://www.edureka.co/blog/aws-lambda-tutorial)blog.

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## Section 9: AWS OpsWorks, AWS KMS

### ****66. How is AWS OpsWorks different than AWS CloudFormation?****

OpsWorks and CloudFormation both support application modelling, deployment, configuration, management and related activities. Both support a wide variety of architectural patterns, from simple web applications to highly complex applications. AWS OpsWorks and AWS CloudFormation differ in abstraction level and areas of focus.

AWS CloudFormation is a building block service which enables customer to manage almost any AWS resource via JSON-based domain specific language. It provides foundational capabilities for the full breadth of AWS, without prescribing a particular model for development and operations. Customers define templates and use them to provision and manage AWS resources, operating systems and application code.

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In contrast, AWS OpsWorks is a higher level service that focuses on providing highly productive and reliable DevOps experiences for IT administrators and ops-minded developers. To do this, AWS OpsWorks employs a configuration management model based on concepts such as stacks and layers, and provides integrated experiences for key activities like deployment, monitoring, auto-scaling, and automation. Compared to AWS CloudFormation, AWS OpsWorks supports a narrower range of application-oriented AWS resource types including Amazon EC2 instances, Amazon EBS volumes, Elastic IPs, and Amazon CloudWatch metrics.

### ****67.**** I created a key in Oregon region to encrypt my data in North Virginia region for security purposes. I added two users to the key and an external AWS account. I wanted to encrypt an object in S3, so when I tried, the key that I just created was not listed.  What could be the reason?

1. External aws accounts are not supported.
2. AWS S3 cannot be integrated KMS.
3. The Key should be in the same region.
4. New keys take some time to reflect in the list.

**Answer C.**

**Explanation:**The key created and the data to be encrypted should be in the same region. Hence the approach taken here to secure the data is incorrect.

### 68.  A company needs to monitor the read and write IOPS for their AWS MySQL RDS instance and send real-time alerts to their operations team. Which AWS services can accomplish this?

1. Amazon Simple Email Service
2. Amazon CloudWatch
3. Amazon Simple Queue Service
4. Amazon Route 53

**Answer B.**

**Explanation:**Amazon CloudWatch is a cloud monitoring tool and hence this is the right service for the mentioned use case. The other options listed here are used for other purposes for example route 53 is used for DNS services, therefore CloudWatch will be the apt choice.

### 69. What happens when one of the resources in a stack cannot be created successfully in AWS OpsWorks?

When an event like this occurs, the “automatic rollback on error” feature is enabled, which causes all the AWS resources which were created successfully till the point where the error occurred to be deleted. This is helpful since it does not leave behind any erroneous data, it ensures the fact that stacks are either created fully or not created at all. It is useful in events where you may accidentally exceed your limit of the no. of Elastic IP addresses or maybe you may not have access to an EC2 AMI that you are trying to run etc.

### 70. What automation tools can you use to spinup servers?

Any of the following tools can be used:

* Roll-your-own scripts, and use the AWS API tools.  Such scripts could be written in bash, perl or other language of your choice.
* Use a configuration management and provisioning tool like puppet or its successor Opscode Chef.  You can also use a tool like Scalr.
* Use a managed solution such as Rightscale.

**1. Compare AWS and OpenStack**

|  |  |  |
| --- | --- | --- |
| **Criteria** | **AWS** | **OpenStack** |
| License | Amazon proprietary | Open Source |
| Operating System | Whatever cloud administrator provides | Whatever AMIs provided by AWS |
| Performing repeatable operations | Through templates | Through text files |

**2. What is AWS?**

AWS (Amazon Web Services) is a platform to provide secure cloud services, database storage, offerings to compute power, content delivery, and other services to help business level and develop.

Learn more about AWS in this insightful [*AWS Tutorial*](https://intellipaat.com/tutorial/amazon-web-services-aws-tutorial/)*!*

**3. What is the importance of buffer in Amazon Web Services?**

An Elastic Load Balancer ensures that the incoming traffic is distributed optimally across various AWS instances.  A buffer will synchronize different components and makes the arrangement additional elastic to a burst of load or traffic. The components are prone to work in an unstable way of receiving and processing the requests. The buffer creates the equilibrium linking various apparatus and crafts them effort at the identical rate to supply more rapid services.

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**4. What is the way to secure data for carrying in the cloud?**

One thing must be ensured that no one should seize the information in the cloud while data is moving from point one to another and also there should not be any leakage with the security key from several storerooms in the cloud. Segregation of information from additional companies’ information and then encrypting it by means of approved methods is one of the options.

Amazon Web Services offers you a secure way of carrying data in the cloud. Looking to master AWS platform?

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**5. Name the several layers of Cloud Computing.**

Here is the list of layers of the cloud computing

* **PaaS** – Platform as a Service
* **IaaS** – Infrastructure as a Service
* **SaaS** – Software as a Service

**6. Distinguish between scalability and flexibility**

The aptitude of any scheme to enhance the tasks on hand on its present hardware resources to grip inconsistency in command is known as scalability. The capability of a scheme to augment the tasks on hand on its present and supplementary hardware property is recognized as flexibility, hence enabling the industry to convene command devoid of putting in the infrastructure at all.  AWS has several configuration management solutions for AWS scalability, flexibility, availability and management.

**7. Name the various layers of the cloud architecture**

There are 5 layers and are listed below

* CC- Cluster Controller
* SC- Storage Controller
* CLC- Cloud Controller
* Walrus
* NC- Node Controller

**8. Define auto-scaling.**

Auto- scaling is one of the remarkable features of AWS where it permits you to arrange and robotically stipulation and spin up fresh examples without the requirement for your involvement. This can be achieved by setting brinks and metrics to watch. If those entrances are overcome, a fresh example of your selection will be configured, spun up and copied into the weight planner collection.

**9. Which automation gears can help with spinup services?**

The API tools can be used for spinup services and also for the written scripts. Those scripts could be coded in Perl, bash or other languages of your preference. There is one more option that is patterned administration and stipulating tools such as a dummy or improved descendant. A tool called Scalr can also be used and finally we can go with a controlled explanation like a Rightscale.

**10. Is it possible to scale an Amazon instance vertically? How?**

Yes, it is possible. Just stop the server and then change its instance type and again start server.

**11. How the processes start, stop and terminate works? How?**

**Starting and stopping of an instance**: If an instance gets stopped or ended, the instance functions a usual power cut and then change over to a clogged position. You can establish the case afterward since all the EBS volumes of Amazon remain attached. If an instance is in stopping state, then you will not get charged for additional instance.

**Finishing the instance**: If an instance gets terminated it tends to perform a typical blackout, so the EBS volumes which are attached will get removed except the volume’s deleteOnTermination characteristic is set to zero. In such cases, the instance will get removed and cannot set it up afterward.

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**12. What is the relation between an instance and AMI?**

AMI can be elaborated as Amazon Machine Image, basically, a template consisting software configuration part. For example an OS, applications, application server. If you start an instance, a duplicate of the AMI in a row as an unspoken attendant in the cloud.

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**13. What is DynamoDB?**

When You require a fast and flexible NoSQL database with a flexible datamodel and reliable performance then DynamoDB is the service from AWS

**14. Security elements used at network and server level in AWS?**

A network ACL is anetwork security for your Amazon VPC that acts as afirewall for controlling traffic in and out of one or more subnets.

Security Groups is security placed at server level which is first level of defence

1. Compare AWS with OpenStack

|  |  |  |
| --- | --- | --- |
| Services | AWS | OpenStack |
| User Interface | GUI-Console  API-EC2 API  CLI -Available | GUI-Console  API-EC2 API  CLI -Available |
| Computation | EC2 | Nova |
| File Storage | S3 | Swift |
| Block Storage | EBS | Cinder |
| Networking | IP addressing Egress, Load Balancing Firewall (DNS) , VPC | IP addressing load balancing firewall (DNS) |
| Big Data | Elastic MapReduce | - |

1. What type of performance can you expect from Elastic Block Storage? How do you back it up and enhance the performance ?

Performance of an elastic block storage varies i.e. it can go above the SLA performance level and after that drop below it. SLA provides an average disk I/O rate  which can at times frustrate performance experts who yearn for reliable and consistent disk throughput on a server. Virtual AWS instances do not behave this way. One can backup EBS volumes through a graphical user interface like elasticfox or use the snapshot facility through an API call. Also, the performance can be improved by using Linux software raid and striping across four volumes.

1. Imagine that you have an AWS application that requires 24x7 availability and can be down only for a maximum of 15 minutes. How will you ensure that the database hosted on your EBS volume is backed up?

Automated backup are the key processes here as they work in the background without requiring any manual intervention. Whenever there is a need to back up the data, AWS API and AWS CLI play a vital role in automating the process through scripts. The best way is to prepare for a timely backup of EBS of the EC2 instance. The EBS snapshot should be stored on Amazon S3 and can be used for recovery of the database instance in case of any failure or downtime.

1. You create a Route 53 latency record set from your domain to a system in Singapore and a similar record to a machine in Oregon. When a user located in India visits your domain, to which location will he be routed to?

Assuming that the application is hosted on Amazon EC2 instance and multiple instances of the applications are deployed on different EC2 regions. The request is most likely to go to Singapore because Amazon Route 53 is based on latency and it routes the requests based on the location that is likely to give the fastest response possible.

1. Differentiate between on-demand instance and spot instance.

Spot Instances  are spare unused EC2 instances which one can bid for. Once the bid exceeds the existing spot price (which changes in real-time based on demand and supply) the spot instance will be launched. If the spot price becomes more than the bid price then the instance can go away anytime and terminated within 2 minutes of notice. The best way to decide on the optimal bid price for a spot instance is to check the price history of last 90 days that is available on AWS console. The advantage of spot instances is that they are cost-effective and the drawback is that they can be terminated anytime. Spot instances are ideal to use when –

* There are optional nice to have tasks.
* You have flexible workloads which can be run when there is enough compute capacity.
* Tasks that require extra computing capacity to improve performance.

On-demand instances are made available whenever you require them and you need to pay for the time you use them on an hourly basis. These instances can be released when they are no longer required and do not require any upfront commitment. The availability fo these instances is guaranteed by AWS unlike spot instances.

The best practice is to launch couple of on-demand instances which can maintain minimum level of guaranteed compute resources for the application and add-on few spot instances whenever there is an opportunity.

1. How will you access the data on EBS in AWS ?

Elastic block storage as the name indicates provides persistent, highly avaialble and high performance block level storage that can be attached to a running EC2 instance. The storage can formatted and mounted as a file system or the raw storage can be accessed directly.

1. What is the boot time for an instance store backed instance ?

The boot time for an Amazon Instance Store -Backed AMI is usually less than 5 minutes.

1. Is it possible to vertically scale on an Amazon Instance?  If yes, how ?

Following are the steps to scale an Amazon Instance vertically –

* Spin up a larger Amazon instance than the existing one.
* Pause the exisiting instance to remove the root ebs volume from the server  and discard.
* Stop the live running instance and detach its root volume.
* Make a note of the unique device ID and attach that root volume to the new server.
* Start the instance again.

1. Differentiate between vertical and horizontal scaling in AWS.

The main difference between vertical and horizontal scaling is the way in which you add compute resources to your infrastructure. In vertical scaling, more power is added to the existing machine while in horizontal scaling additional resources are added into the system with the addition of more machines into the network so that the workload and processing is shared among multiple devices. The best way to understand the difference is imagine that you are retiring your Toyota and buying a Ferrari because you need more horsepower. This is vertical scaling. Another way to get that added horsepower is not to ditch the Toyota for the Ferrari but buy another car. This can be related to horizontal scaling where you drive several cars all at once.

When the users are up to 100, an EC2 instance alone is enough to run the entire web application or the database until the traffic ramps up. Under such circumstances when the traffic ramps up, it is better to scale vertically by increasing the capacity of the EC2 instance to meet the increasing demands of the application. AWS supports instances up to 128 virtual cores or 488GB RAM.

When the users for your application grow up to 1000 or more, vertical cannot handle requests and there is need for horizontal scaling which is achieved through distributed file system, clustering, and load balancing.

1. What is the total number of buckets that can be created in AWS by default ?

100 buckets can be created in each of the AWS accounts. If additional buckets are required, increase the bucket limit by submitting a service limit increase.

1. Differentiate between Amazon RDS, Redshift and Dynamo DB.

|  |  |  |  |
| --- | --- | --- | --- |
| Features | Amazon RDS | Redshift | Dynamo DB |
| Computing Resources | Instances with 64 vCPU and 244 GB RAM | Nodes with vCPU and 244 GB RAM | Not specified, SaaS-Software as a Service. |
| Maintenance Window | 30 minutes every week. | 30 minutes every week. | No impact |
| Database Engine | MySQL, Oracle DB, SQL Server,Amazon Aurora, Postgre SQL | Redshift | NoSQL |
| Primary Usage Feature | Conventional Databases | Datawarehouse | Database for dynamically modified data |
| Multi A-Z Replication | Additional Service | Manual | In-built |

1. An organization wants to deploy a two-tier web applications on AWS.  The application requires complex query processing and table joins. However, the company has limited resources and requires high availability. Which is the best configuration that company can opt for based on the requirements ?

DynamoDB deals with core problems of database scalability, management, reliability, and performance but does not have the functionalities of a RDBMS. DynamoDB does not render support for complex joins or query processing or complex transactions.  You can run a relational engine on Amazon RDS or EC2 for this kind of a functionality.

1. If you have half of the workload on public cloud while the other half is on local storage, what kind of architecture will you use for this ?

Hybrid Cloud Architecture

1. Is it possible to cast-off S3 with EC2 instances ? If yes, how ?

It is possible to cast-off S3 with EC2 instances using root approaches backed by native occurrence storage.

1. How will you configure an instance with the application and its dependencies , and make it ready to serve traffic?

You can acheive this with the use of lifecycle hooks. They are powerful as they let you pause the creation or termination of an instance so that you can sneak peak in and perform custom actions like configuring the instance, downloading the required files, and any other steps that are required to make the instance ready.Every auto scaling group can have multiple lifecycle hooks.

1. How can you safeguard EC2 instances running on a VPC ?

AWS Security groups associated with EC2 instances can help you safeguard EC2 instances running in a VPC by providing security at the protocol and port access level. You can configure both INBOUND and OUTBOUND traffic to enables secured access for the EC2 instance.AWS security groups are much similar to a firewall-they contain set of rules which filter the traffic coming into and out of an EC2 instance and deny any kind of unauthorized access to EC2 instances.

1. How many EC2 instances can be used in a VPC ?

There is a limit of running up to a total of 20 on-demand instances across the instance family , you can purchase 20 reserved instances and request spot instances as per your dynamic spot limit region.

1. What are some of the key best practices for security in Amazon EC2?

* Create individual IAM (Identity and Access Management) users to control access to your AWS recourses. Creating separate IAM user provides separate credentials for every user making it possible to assign different permissions to each user based on the access requirements.
* Secure the AWS Root account and its access keys.
* Harden EC2  instances by disabling unnecessary services and applications by installing only necessary software and tools on EC2 instances.
* Grant least privileges by opening up permissions that are required to perform a specific task and not more than that. Additional permissions can be granted as required.
* Define and review the security group rules on a regular basis.
* Have a well-defined strong password policy for all the users.
* Deploy anti-virus software on the AWS network to protect it from Trojans, Viruses, etc.

1. What should be the instance’s tenancy attribute for running it on a single tenant hardware ?

The instance tenancy attribute must be set to a dedicated instance and other values might not be appropriate for this operation.

1. There is a distributed application that processes huge amounts of data across various EC2 instances.  Application is designed in such a way that it can recover gracefully from EC2 instance failures. How will you accomplish this in a cost effective manner ?

On-demand or reserved instance will not be ideal in this case as the task here is not continuous. Moreover. It does not make sense to launch an on-demand instance whenever work comes up because on-demand instances are expensive.In this case, the ideal choice would be to opt for a spot instance owing to its cost effectiveness and no long term commitments.

1. What are the important features of a classic load balancer in EC2 ?

* The high availability feature ensures that the traffic is distributed among EC2 instances in single or multiple availability zones.This ensures high scale of availability for incoming traffic.
* Classic load balancer can decide whether to route the traffic or not based on the results of health check.
* You can implement secure load balancing within a network  by creating security groups in a VPC.
* Classic load balancer supports sticky sessions which ensure that the traffic from a user is always routed to the same instance for a seamless experience.

1. What parameters will you take into consideration when choosing the availability zone ?

Performance, pricing, latency, and response time are some of the factors to consider when selecting the availability zone.

1. Which instance will you use for deploying a 4-node Hadoop cluster in AWS ?

We can use a c4.8x large instance or i2.large for this, but using a c4.8x will require a better configuration on PC.

1. Will you use encryption for S3 ?

It is better to consider encryption for sensitive data on S3 as it is a proprietary technology.

1. How can you send request to Amazon S3 ?

Using the REST API or the AWS SDK wrapper libraries which wrap the underlying Amazon S3 REST API.

1. How will you bind the user session with a specific instance in ELB (Elastic Load Balancer) ?

This can be achieved by enabling Sticky Session.

1. What are the possible connection issues you encounter when connecting to an EC2 instance ?

* Unprotected private key file
* Server refused key
* Connection timed out
* No supported authentication method available
* Host key not found,permission denied.
* User key not recognized by the server, permission denied.

1. What is the difference between Amazon S3 and EBS ?

|  |  |  |
| --- | --- | --- |
|  | Amazon S3 | EBS |
| Paradigm | Object Store | Filesystem |
| Security | Private Key or Public Key | Visible only to your EC2 |
| Redundancy | Across data centers | Within the data center |
| Performance | Fast | Superfast |

1. Can you run multiple websites on an EC2 server using a single IP address?

More than one elastic IP is required to run multiple websites on EC2.

1. What happens when you reboot an EC2 instance?

Rebooting an instance is just similar to rebooting a PC. You do not return to image’s original state, however, the contents of the hard disk are same as before the reboot.

1. A content management system running on EC2 instance is approaching 100% CPU utilization. How will you reduce the load on EC2 instance ?

This can be done by attaching a load balancer to an autoscaling group to efficiently distribute load among all instances.

1. What happens when you launch instances in Amazon VPC ?

Each instance has a default IP address when the instance is launched in Amazon VPC. This approach is considered ideal when you need to connect cloud resources with the data centers.

1. Can you modify the private IP address of an EC2 instance while it is running in a VPC ?

It is not possible to change the primary private IP addresses. However, secondary IP addresses can be assigned, unassigned or moved between instances at any given point.

1. You are launching an instance under the free usage tier from AMI having a snapshot size of 50GB. How will you launch the instance under the free usage tier ?

It is not possible to launch this instance under the free usage tier.

1. Which load balancer will you use to make routing decisions at the application layer or transport layer that  supports either VPC or EC2?

**1) Explain what AWS is?**

AWS stands for Amazon Web Service; it is a collection of remote computing services also known as a cloud computing platform.  This new realm of cloud computing is also known as IaaS or Infrastructure as a Service.

**2) Mention what the key components of AWS are?**

The key components of AWS are

* **Route 53:**A DNS web service
* **Simple E-mail Service:**It allows sending e-mail using RESTFUL API call or via regular SMTP
* **Identity and Access Management:**It provides enhanced security and identity management for your AWS account
* **Simple Storage Device or (S3):**It is a storage device and the most widely used AWS service
* **Elastic Compute Cloud (EC2):**It provides on-demand computing resources for hosting applications. It is handy in case of unpredictable workloads
* **Elastic Block Store (EBS):**It offers persistent storage volumes that attach to EC2 to allow you to persist data past the lifespan of a single Amazon EC2 instance
* **CloudWatch:**To monitor AWS resources, It allows administrators to view and collect key Also, one can set a notification alarm in case of trouble.

**3) Explain what S3 is?**

S3 stands for Simple Storage Service. You can use S3 interface to store and retrieve any amount of data, at any time and from anywhere on the web.  For S3, the payment model is “pay as you go.”

**4) What is AMI?**

AMI stands for Amazon Machine Image.  It’s a template that provides the information (an operating system, an application server, and applications) required to launch an instance, which is a copy of the AMI running as a virtual server in the cloud.  You can launch instances from as many different AMIs as you need.

**5) Mention what the relationship between an instance and AMI is?**

From a single AMI, you can launch multiple types of instances.  An instance type defines the hardware of the host computer used for your instance. Each instance type provides different computer and memory capabilities.  Once you launch an instance, it looks like a traditional host, and we can interact with it as we would with any computer.[](https://career.guru99.com/wp-content/uploads/2015/11/aws_interview_questions_1.png)

**6) What does an AMI include?**

An AMI includes the following things

* A template for the root volume for the instance
* Launch permissions decide which AWS accounts can avail the AMI to launch instances
* A block device mapping that determines the volumes to attach to the instance when it is launched

**7) How can you send a request to Amazon S3?**

Amazon S3 is a REST service, and you can send a request by using the REST API or the AWS SDK wrapper libraries that wrap the underlying Amazon S3 REST API.

**8) Mention what the difference between Amazon S3 and EC2 is?**  
The difference between EC2 and Amazon S3 is that

|  |  |
| --- | --- |
| **EC2** | **S3** |
| * It is a cloud web service used for hosting your application | * It is a data storage system where any amount of data can be stored |
| * It is like a huge computer machine which can run either Linux or Windows and can handle application like PHP, Python, Apache or any databases | * It has a REST interface and uses secure HMAC-SHA1 authentication keys |

**9) How many buckets can you create in AWS by default?**

By default, you can create up to 100 buckets in each of your AWS accounts.

**10) Explain can you vertically scale an Amazon instance? How?**

Yes, you can vertically scale on Amazon instance. For that

* Spin up a new larger instance than the one you are currently running
* Pause that instance and detach the root webs volume from the server and discard
* Then stop your live instance and detach its root volume
* Note the unique device ID and attach that root volume to your new server
* And start it again

**11) Explain what T2 instances is?**

T2 instances are designed to provide moderate baseline performance and the capability to burst to higher performance as required by the workload.

**12) In VPC with private and public subnets, database servers should ideally be launched into which subnet?**

With private and public subnets in VPC, database servers should ideally launch into private subnets.

**13) Mention what the security best practices for Amazon EC2 are?**

For secure Amazon EC2 best practices, follow the following steps

* Use AWS identity and access management to control access to your AWS resources
* Restrict access by allowing only trusted hosts or networks to access ports on your instance
* Review the rules in your security groups regularly
* Only open up permissions that you require
* Disable password-based login, for example, launched from your AMI

**14) Explain how the buffer is used in Amazon web services?**

The buffer is used to make the system more robust to manage traffic or load by synchronizing different component.  Usually, components receive and process the requests in an unbalanced way. With the help of buffer, the components will be balanced and will work at the same speed to provide faster services.

**15) While connecting to your instance what are the possible connection issues one might face?**

The possible connection errors one might encounter while connecting instances are

* Connection timed out
* User key not recognized by the server
* Host key not found, permission denied
* An unprotected private key file
* Server refused our key or No supported authentication method available
* Error using MindTerm on Safari Browser
* Error using Mac OS X RDP Client

**16) What are key-pairs in AWS?**

Key-pairs are secure login information for your virtual machines. To connect to the instances, you can use key-pairs which contain a public-key and private-key.

**17)  What are the different types of instances?**

Following are the types of instances:

* General purpose
* Computer Optimized
* Memory Optimized
* Storage Optimized
* Accelerated Computing

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* Amazon S3 standard-infrequent Access
* Amazon S3 Reduced Redundancy Storage
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1. MS-SQL DB
2. MariaDB
3. MYSQL DB
4. OracleDB
5. PostgreDB

**1) Explain what AWS is?**

AWS stands for Amazon Web Service; it is a collection of remote computing services also known as a cloud computing platform.  This new realm of cloud computing is also known as IaaS or Infrastructure as a Service.

**2) Mention what the key components of AWS are?**

The key components of AWS are

* **Route 53:**A DNS web service
* **Simple E-mail Service:**It allows sending e-mail using RESTFUL API call or via regular SMTP
* **Identity and Access Management:**It provides enhanced security and identity management for your AWS account
* **Simple Storage Device or (S3):**It is a storage device and the most widely used AWS service
* **Elastic Compute Cloud (EC2):**It provides on-demand computing resources for hosting applications. It is handy in case of unpredictable workloads
* **Elastic Block Store (EBS):**It offers persistent storage volumes that attach to EC2 to allow you to persist data past the lifespan of a single Amazon EC2 instance
* **CloudWatch:**To monitor AWS resources, It allows administrators to view and collect key Also, one can set a notification alarm in case of trouble.

**3) Explain what S3 is?**

S3 stands for Simple Storage Service. You can use S3 interface to store and retrieve any amount of data, at any time and from anywhere on the web.  For S3, the payment model is “pay as you go.”

**4) What is AMI?**

AMI stands for Amazon Machine Image.  It’s a template that provides the information (an operating system, an application server, and applications) required to launch an instance, which is a copy of the AMI running as a virtual server in the cloud.  You can launch instances from as many different AMIs as you need.

**5) Mention what the relationship between an instance and AMI is?**

From a single AMI, you can launch multiple types of instances.  An instance type defines the hardware of the host computer used for your instance. Each instance type provides different computer and memory capabilities.  Once you launch an instance, it looks like a traditional host, and we can interact with it as we would with any computer.[](https://career.guru99.com/wp-content/uploads/2015/11/aws_interview_questions_1.png)

**6) What does an AMI include?**

An AMI includes the following things

* A template for the root volume for the instance
* Launch permissions decide which AWS accounts can avail the AMI to launch instances
* A block device mapping that determines the volumes to attach to the instance when it is launched

**7) How can you send a request to Amazon S3?**

Amazon S3 is a REST service, and you can send a request by using the REST API or the AWS SDK wrapper libraries that wrap the underlying Amazon S3 REST API.

**8) Mention what the difference between Amazon S3 and EC2 is?**  
The difference between EC2 and Amazon S3 is that

|  |  |
| --- | --- |
| **EC2** | **S3** |
| * It is a cloud web service used for hosting your application | * It is a data storage system where any amount of data can be stored |
| * It is like a huge computer machine which can run either Linux or Windows and can handle application like PHP, Python, Apache or any databases | * It has a REST interface and uses secure HMAC-SHA1 authentication keys |

**9) How many buckets can you create in AWS by default?**

By default, you can create up to 100 buckets in each of your AWS accounts.

**10) Explain can you vertically scale an Amazon instance? How?**

Yes, you can vertically scale on Amazon instance. For that

* Spin up a new larger instance than the one you are currently running
* Pause that instance and detach the root webs volume from the server and discard
* Then stop your live instance and detach its root volume
* Note the unique device ID and attach that root volume to your new server
* And start it again

**11) Explain what T2 instances is?**

T2 instances are designed to provide moderate baseline performance and the capability to burst to higher performance as required by the workload.

**12) In VPC with private and public subnets, database servers should ideally be launched into which subnet?**

With private and public subnets in VPC, database servers should ideally launch into private subnets.

**13) Mention what the security best practices for Amazon EC2 are?**

For secure Amazon EC2 best practices, follow the following steps

* Use AWS identity and access management to control access to your AWS resources
* Restrict access by allowing only trusted hosts or networks to access ports on your instance
* Review the rules in your security groups regularly
* Only open up permissions that you require
* Disable password-based login, for example, launched from your AMI

**14) Explain how the buffer is used in Amazon web services?**

The buffer is used to make the system more robust to manage traffic or load by synchronizing different component.  Usually, components receive and process the requests in an unbalanced way. With the help of buffer, the components will be balanced and will work at the same speed to provide faster services.

**15) While connecting to your instance what are the possible connection issues one might face?**

The possible connection errors one might encounter while connecting instances are

* Connection timed out
* User key not recognized by the server
* Host key not found, permission denied
* An unprotected private key file
* Server refused our key or No supported authentication method available
* Error using MindTerm on Safari Browser
* Error using Mac OS X RDP Client

**16) What are key-pairs in AWS?**

Key-pairs are secure login information for your virtual machines. To connect to the instances, you can use key-pairs which contain a public-key and private-key.

**17)  What are the different types of instances?**

Following are the types of instances:

* General purpose
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#### 1. What do you understand by AWS?

**Answer:** This is one of the commonly asked AWS developer interview questions. This question checks your basic AWS knowledge so the answer should be straightforward. Amazon Web Services (AWS) is a cloud service platform which offers computing power, analytics, content delivery, database storage, deployment and some other services to help you in your business growth. These services are highly scalable, reliable, secure, and inexpensive cloud computing services which are outlined to work together and, applications thus created are more advanced and escalade.

Confused about choosing right AWS certification? Let’s clear out the confusion – [*Which AWS certification should I choose?*](https://www.whizlabs.com/blog/which-aws-certification-should-i-choose/)

#### 2. Explain the main elements of AWS?

**Answer:** The main elements of AWS are:

**Route 53:** Route53 is a highly scalable DNS web service.

**Simple Storage Service (S3):**S3 is most widely used AWS storage web service.

**Simple E-mail Service (SES):** SES is a hosted transactional email service and allows one to fluently send deliverable emails using a RESTFUL API call or through a regular SMTP.

**Identity and Access Management (IAM):** IAM provides improved identity and security management for AWS account.

**Elastic Compute Cloud (EC2):** EC2 is an AWS ecosystem central piece. It is responsible for providing on-demand and flexible computing resources with a “pay as you go” pricing model.

**Elastic Block Store (EBS):** EBS offers continuous storage solution that can be seen in instances as a regular hard drive.

**CloudWatch:** CloudWatch allows the controller to outlook and gather key metrics and also set a series of alarms to be notified if there is any trouble.

This is among frequently asked AWS developer interview questions. Just get the interviewer mind and answer accordingly either with components name or with the description along with.

[](https://www.whizlabs.com/aws-solutions-architect-associate/online-course/)

#### 3. What do you mean by AMI? What does it include?

**Answer:** You may come across one or more AMI related AWS developer interview questions during your AWS developer interview. So, prepare yourself with a good knowledge of AMI.

AMI stands for the term Amazon Machine Image.  It’s an AWS template which provides the information (an application server, and operating system, and applications) required to perform the launch of an instance. This AMI is the copy of the AMI that is running in the cloud as a virtual server.  You can launch instances from as many different AMIs as you need. AMI consists of the followings:

* A root volume template for an existing instance
* Launch permissions to determine which AWS accounts will get the AMI in order to launch the instances
* Mapping for block device to calculate the total volume that will be attached to the instance at the time of launch

Preparing for AWS Certified Developer certification exam? Try [Free Test](https://www.whizlabs.com/aws-developer-associate/free-test/) Now!

#### 4. Is vertically scale is possible on Amazon instance?

**Answer:** Yes, vertically scale is possible on Amazon instance.

This is one of the common AWS developer interview questions. If the interviewer is expecting to get a detailed answer from you then explain the procedure for vertical scaling.

#### 5. What is the connection between AMI and Instance?

**Answer:** Many different types of instances can be launched from one AMI. The type of an instance generally regulates the hardware components of the host computer that is used for the instance. Each type of instance has distinct computing and memory efficacy.

Once an instance is launched, it casts as host and the user interaction with it is same as with any other computer but we have a completely controlled access to our instances. AWS developer interview questions may contain one or more AMI based questions, so prepare yourself for the AMI topic very well.

#### 6. What is the difference between Amazon S3 and EC2?

**Answer:** The difference between Amazon S3 and EC2 is given below:

|  |  |
| --- | --- |
| [**Amazon S3**](https://www.whizlabs.com/blog/aws-s3/) | [**Amazon EC2**](https://www.whizlabs.com/blog/aws-ec2-highavailability/) |
| The meaning of S3 is Simple Storage Service. | The meaning of EC2 is Elastic Compute Cloud. |
| It is just a data storage service which is used to store large binary files. | It is a cloud web service which is used to host the application created. |
| It is not required to run a server. | It is enough to run a server. |
| It has a REST interface and uses secure HMAC-SHA1 authentication keys. | It is just like a huge computer machine which can handle application like Python, PHP, Apache and any other database. |

When you are going for an AWS developer interview, prepare yourself with the concepts of Amazon S3 and EC2, and the difference between them.

Enhance your AWS knowledge by reading this article – [How to Secure Files in Amazon S3?](https://www.whizlabs.com/blog/aws-s3-data-security/)

#### 7. How many storage options are there for EC2 Instance?

**Answer:** There are four storage options for Amazon EC2 Instance:

* Amazon EBS
* Amazon EC2 Instance Store
* Amazon S3
* Adding Storage

Amazon EC2 is the common topic you may come across while going through AWS developer interview questions. Get a thorough knowledge of the EC2 instance and all the storage options for the EC2 instance.

#### 8. What are the security best practices for Amazon Ec2 instances?

**Answer:** There are a number of best practices for securing Amazon EC2 instances that are applicable whether instances are running on on-premise data centers or on virtual machines. Let’s have a look at some general best practices:

**Least Access:** Make sure that your EC2 instance has controlled access to the instance as well as to the network. Offer access authorities only to the trusted entities.

**Least Privilege:** Follow the necessary principle of least privilege for instances and users to perform the functions. Generate roles with restricted access for the instances.

**Configuration Management:** Consider every EC2 instance a configuration item and use AWS configuration management services to have a baseline for the configuration of the instances as these services include updated anti-virus software, security features etc.

Whatever be the job role, you may come across security based AWS interview questions. So, get prepared with this question to crack the AWS developer interview.

Also Read:  [How to troubleshoot and monitor EC2 instances using CloudWatch?](https://www.whizlabs.com/blog/aws-cloudwatch/)

#### **9.**Explain the features of Amazon EC2 services.

**Answer:** Amazon EC2 services have following features:

* Virtual Computing Environments
* Proffers Persistent storage volumes
* Firewall validating you to specify the protocol
* Pre-configured templates
* Static IP address for dynamic Cloud Computing

#### 10. What is the procedure to send a request to Amazon S3?

**Answer:** There are 2 ways to send a request to Amazon S3 –

1. Using REST API
2. Using AWS SDK Wrapper Libraries, these wrapper libraries wrap the REST APIs for Amazon S3

Get familiar with the basics of Amazon S3. Learn now [How to setup and use Amazon S3 servic*e?*](https://www.whizlabs.com/blog/aws-s3/)

#### 11. What is the default number of buckets created in AWS?

**Answer:** This is a very simple question but ranks high among AWS developer interview questions. Answer this question directly as the default number of buckets created in each AWS account is 100.

#### 12. What is the purpose of T2 instances?

**Answer:** T2 instances are designed for

* Providing moderate baseline performance
* Higher performance as required by workload

[](https://www.whizlabs.com/aws-sysops-administrator-associate/online-course/)

#### 13. What is the use of the buffer in AWS?

**Answer:** This is among frequently asked AWS developer interview questions. Give the answer in simple terms, the buffer is mainly used to manage load with the synchronization of various components i.e. to make system fault tolerant. In the absence of buffer, components do not use any balanced method to receive and process requests. But the buffer makes components to work in a balanced manner and at the same speed, thus results in faster services.

#### 14. What happens when an Amazon EC2 instance is stopped or terminated?

**Answer:** At the time of stopping an Amazon EC2 instance, a shutdown is performed in a normal manner. After that, the transitions to the stopped state occur. During this, all of the Amazon EBS volumes are remained attached to the instance and the instance can be started anytime. The instance hours are not counted when the instance is in the stopped state.

At the time of terminating an Amazon EC2 instance, a shutdown is performed in a normal manner. During this, the deletion of all of the Amazon EBS volumes is performed. To avoid this, the value of attribute deleteOnTermination is set to false. On termination, the instance also undergoes deletion, so the instance can’t be started again.

#### 15. What are the popular DevOps tools?

**Answer:** In an AWS DevOps Engineer interview, this is the most common AWS interview questions for DevOps. To answer this question, mention the popular DevOps tools with the type of tool –

* Jenkins – Continuous Integration Tool
* Git – Version Control System Tool
* Nagios – Continuous Monitoring Tool
* Selenium – Continuous Testing Tool
* Docker – Containerization Tool
* Puppet, Chef, Ansible – Deployment and Configuration Management Tools

|  |  |  |
| --- | --- | --- |
| **Amazon AWS vs Microsoft Azure** | | |
| **Area** | **AWS** | **Azure** |
| Security | AWS Shield | DDos Protection Service |
| DB migration | DB Migration available as preview service | Azure also provides DB Migration |
| NoSQL | Dynamo Data Base | Azure Cosmos Data Base |
| Content delivery network | CloudFront | Azure Content Delivery NW |
| Container instances | EC2 Container Service (ECS) | Azure Container Service |
| Programmatic access | Command Line Interface | Azure Command Line Interface (CLI) |
| Batch computing | AWS Batch | Azure Batch |
| ***Read More @***[***AWS Vs Azure***](https://mindmajix.com/aws-vs-azure) | | |

##### Q1) What is Amazon Web Services?

**Ans:**AWS stands for **Amazon Web Services**, which is a **cloud computing** platform. It is designed in such a way to provide cloud services in the form of small building blocks, and these blocks help create and deploy various types of applications in the cloud. These sequence of small blocks are integrated together to deliver the services in a highly scalable manner.

##### Q2) Explain what S3 is all about?

**Ans:**S3 is abbreviated as simple storage service. It is used for storing and retrieving data at any time and anywhere on the web. S3 makes web-scale computing easier for developers. The payment mode of [S3](https://mindmajix.com/aws-outage) available on a pay as you go basis.

##### Q3) What are the main components of AWS?

**Ans:**The key components of AWS are:

* **Simple Email service:** It allows you to send the send emails with the help of using regular SMTP or by using a restful API call
* **Route 53**: it’s a DNS web service.
* **Simple Storage Device S3:** It is a widely used storage device service in **AWS Identity** and Access management
* **Elastic compute cloud( EC2):** it acts as an on-demand computing resource for hosting applications. EC2 is very helpful in time of uncertain workloads.
* **Elastic Block Store:** it allows you to store constant volumes of data which is integrated with **EC2**, which will enable you to data persist.
* **Cloud watch:** it allows you to watch the critical areas of the AWS with which you can even set a reminder for troubleshooting.

**[Related Blog:**[**AWS Elastic Beanstalk**](https://mindmajix.com/aws-elastic-beanstalk)**]**

##### Q4) What is AMI:

**Ans:**It stands for **Amazon Machine Image**. The AMI contains essential information required to launch an instance, and it is a copy of [AMI](https://mindmajix.com/aws/creating-a-custom-ami-in-aws) running in the cloud.  You can download as many examples as possible from multiple AIM’s.

##### Q5) Explain the relationship between an instance and AMI is?

**Ans:**Using a single AIM, you can download as many instances as you can.  An instance type is used to define the hardware of the host computer for your situation. Each instance is unique and provides the facilities in computational and storage capabilities. Once you install an instance, it looks similar to a traditional host with which we can interact in the same way we do with a computer.

##### Q6) What are the things that are included in the AIM?

**Ans:**An AIM consists of the things which are mentioned below

* A template for the instance
* Launch permissions
* A block mapping which decides the volume to be attached when it gets launched.

**Accelerate your career with**[**AWS Certified Training**](https://mindmajix.com/aws-certified-training)**and become expertise in Amazon Web Services.**

##### Q7) What is the procedure to send a request to Amazon S3?

**Ans:**S3 in Amazon is a RESt service, and you can send requests by using the **AWS SDK** or REST API wrapper libraries.

##### Q8) What are the key pairs?

**Ans:**Key pairs act as a guard to make your login process secured into instances/virtual machines. To login to the devices, we use both keys, which are a public key and private key.

##### Q9) What are the pricing models available for EC2 instances?

**Ans:**Different pricing models available for EC2 models are below mentioned ones.

* On-demand
* Spot
* Dedicated
* Reserved
* Scheduled

##### Q10) Explain the types of instances available?

**Ans:**Below stated are the available instances:

* General purpose
* Storage optimized
* Accelerated computing
* Computer-optimized
* Memory-optimized

###### Q11)  Will it be possible to scale the instances in AWS? If yes, how?

**Ans:**Yes! It is possible in AWS to stop the instances. To do so, we need to stop the server and then make the change instance type and then start the server.

###### Q12) Explain about DynamoDB?

**Ans:**If you want to have a faster and flexible NoSQL database, then the right thing available is DynamoDB, which is a flexible and efficient database model available in Amazon web services.

**[Related Blog:**[**Pricing concepts in AWS**](https://mindmajix.com/aws/pricing-concepts-in-aws)**]**

###### Q13) Explain the process to secure the data for carrying in the cloud?

**Ans:**One thing that must be taken into consideration is that no one should size the data while it is moving from one point to another. The other thing to consider is there should not be any kind of leakages with the security key form the multiple storerooms in the cloud. Dividing the information into different types and by encrypting it into the valid methods could help you in securing the data in the cloud.

###### Q14) What are the layers available in cloud computing?

**Ans:**Below listed are the various layers of cloud computing

* **SaaS:** Software as a Service
* **PaaS:** Platform as a Service
* **IaaS:** Infrastructure as a Service

###### Q15) Explain the layers of Cloud architecture?

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**Ans:**We have five different types of layers available, which are

* **SC**- Storage controller
* **CC**- cluster controller
* **NC**- Node controller
* Walrus
* **CLC**- cloud controller

###### Q16) What are the reserved instances?

**Ans:**It is nothing but a reservation of resources for one or three years and utilized whenever you need. The reservation comes on a subscription basis available for a term of 1 year and three years. The hourly rate goes down as the usage increases.  Purchasing reservation not just associated with the reservation of resources but also it comes with the capacity that is required for a particular zone.

###### Q17) What is meant by cloud watch?

**Ans:**Cloud watching is a monitoring tool in [Amazon Web Services](https://mindmajix.com/aws/amazon-webservices-overview) with which you can monitor different resources of your organization.  You can have a look at various things like health, applications, network, etc.

###### Q18) How many types of cloud watches do we have?

**Ans:**We have two types in cloud watch, which are essential monitoring as well as detailed monitoring. The necessary tracking will come to you at free of cost, but when it comes to detailed control, you need to pay for it.

###### Q19) Explain the cloud watch metrics that are meant for EC2 instances?

**Ans:**The available metrics for EC2 instances are Diskreads, CPU utilization, network packetsOut, CPUCreditUsage, Disk writes, networkpacketsIn, networkOut, CPUCreditBalance.

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###### Q20) What would be the minimum and maximum size of the individual objects that you can store in S3?

**Ans:**The minimum size of the object that you can store in S3 is 0 bite, and the maximum size of an individual object that you can save is 5TB.

##### Q21) Explain the various storage classes available in S3?

**Ans:**Below mentioned are the storage classes available in S3.

* Standard frequency accessed
* One-zone infrequency accessed
* RRS - reduced redundancy storage
* Standard infrequency accessed
* Glacier.

##### Q22) What is Glacier?

**Ans:**The Glacier is the backup tool available in amazon web services to retrieve or back up the data in S3.

##### Q24) What are the methods to encrypt the data in S3?

**Ans:**We have three different methods available for encrypting the data in S3, which are as follows.

* Server Side Encryption - C
* Server Side Encryption - S3
* Server Side Encryption - KMS

##### Q25) On what basis Pricing of the S3 is decided?

**Ans:**The pricing for S3 is decided by taking into consideration below topics.

* Data transfer
* Storage used
* Number of requests
* Transfer acceleration
* Storage management

##### Q26) Is the property of broadcast or multicas rted by Amazon VPC? t supported by Amazon VPC?

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**Ans:**No, at present, [Amazon VPC](https://docs.aws.amazon.com/vpc/latest/userguide/what-is-amazon-vpc.html) is not supporting any multicast or broadcast.

##### Q27) How many IP addresses are allowed for each account in AWS?

**Ans:**For each AWS account, 5 VPC elastic addresses are allowed.

##### Q28) What is meant by Edge location?

**Ans:**The actual content is cached at these places called edge location. So whenever a user searches for the content, he will find the same at the edge locations.

##### Q29) What is Snowball?

**Ans:**Snowball is an option available in AWS to transport. Using snowball, one can transfer the data into the AWS and out of it. It helps us in transporting massive amounts of data from one destination to another. It helps in lowering the networking expenditure.

##### Q30) What is Redshift?

**Ans:**Redshift is a big data product used as a data warehouse in the cloud. It is the fast, reliable and powerful product of big data warehouse.

**[Related Blog:**[**Big Money With AWS Certification**](https://mindmajix.com/earning-big-money-with-aws-certification)**]**

###### Q31) Explain the advantages of auto-scaling?

**Ans:**Below listed are the advantages of autoscaling

* Better availability
* Better cost management
* High fault tolerant

###### Q32)What is subnet?

**Ans:**When a large amount of IP addresses are divided into small chunks, then these tiny chunks are called as Subnets.

###### Q33) What is the number of subnets that we can per VPC?

**Ans:**Under one VPC you can have 200 subnets.

###### Q34) What is the purpose of AWS CloudTrail?

**Ans:**It is a tool specially designed and dedicated to for logging and tracking IP calls. It also helps us in auditing all S3 bucket access.

###### Q35) What is meant by Elasticache?

**Ans:**Elasticache is a web service which makes the path easier to deploy and store the data in the cloud easily.

###### Q36)Explain about AWS Lambda?

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**Ans:**AWS Lambda is a computational service that enables you to run code without maintaining any servers. It automatically executes the code whenever needed. You are required to pay for the time that you have used it for. Lambda enables you to run the code virtually for any kind of [application](https://mindmajix.com/aws/how-to-deploy-your-application-into-aws)without managing without any servers.

###### Q37) What are the Types of AMI Provided by AWS?

**Ans:**Below listed are the two kinds of AMIs provided by AWS which are:

* EBS backed
* Instance store backed

###### Q39) What is Geo Restriction in CloudFront?

**Ans:**It is an important feature available in AWS, which helps you in preventing the users from accessing the content from specific regions. CloudFront is useful for distributing the content only on desired locations.

##### Q40) What is Amazon EMR?

**Ans: Amazon EMR** is a survived cluster stage it helps you to create data structures before the intimation. Big data technologies such as [Apache Hadoop](https://mindmajix.com/hadoop-mapreduce) and spark are the tools which enable you to investigate a large amount of data. You can use the data for making analytical goals by using the apache hive and other relevant open source technologies.

##### Q41) What is the actual boot time taken to instance stored-backend AMI?

**Ans:**It takes less than 5 minutes to store the instance-backed AMI.

##### Q42) What are the various types of Load Balancers available in AWS?

**Ans:**There are two types of load balancers available in AWS which are

* Classic load balancer
* Application Load Balancer

##### Q43) Explain the essential features of Amazon cloud search?

**Ans:**Below listed are the essential features of Amazon cloud search.

* Prefixes Searches
* Enter text search
* Boolean searches
* Range searches
* Autocomplete Advice

##### Q44) Give a few examples of DB engines which are used in AWS RDS?

**Ans:**

* MariaDB
* OracleDB
* MS-SQL DB
* MYSQL DB
* Postgre DB

##### Q45) Explain the advantages of cloud computing?

**Ans:**Many advantages arise because usage of cloud; some of them are:

* Scalability
* High availability
* Go global in no time
* Pay for what you use
* Elasticity
* Increased speed and agility.

##### Q46) What is the security group?

**Ans:**In AWS the in and out traffic to instances are controlled with virtual firewalls which are known as Security groups. Security groups allow you to control traffic based on various aspects such as protocol, port and source destination.

##### Q47) What is the difference between block storage and file storage?

**Ans:**

* **Block Storage:** it functions at a lower level and manages the data asset of blocks.
* **File Storage:** The file storage operates at a higher level or operational level and manages data in the form of files and folders.

##### Q48) Explain the types of Routing policies available in Amazon route 53?

**Ans:**

* Latency-based
* Weighted
* Failover
* Simple
* Geolocation

##### Q49) List the default tables that we get when we create AWS VPC?

**Ans:**

* Network ACL
* Security group
* Route table

##### Q50) List the different ways to access AWS?

**Ans:**We have three different ways to access AWS such as

* Console
* SDK
* CLI

###### Q51) What are the EBS volumes?

**Ans:**The EBS is abbreviated as an Elastic Block Stores. These blocks act as a persistent volume which can be attached to the instances. The EBS volumes will store the data even if you stop the instances.

Q: What is AWS Lambda?

AWS Lambda lets you run code without provisioning or managing servers. You pay only for the compute time you consume - there is no charge when your code is not running. With Lambda, you can run code for virtually any type of application or backend service - all with zero administration. Just upload your code and Lambda takes care of everything required to run and scale your code with high availability. You can set up your code to automatically trigger from other AWS services or call it directly from any web or mobile app.

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Q: What is serverless computing?

Serverless computing allows you to build and run applications and services without thinking about servers. With serverless computing, your application still runs on servers, but all the server management is done by AWS. At the core of serverless computing is AWS Lambda, which lets you run your code without provisioning or managing servers. Learn more about serverless computing by visiting [here](https://aws.amazon.com/serverless/).

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Q: What events can trigger an AWS Lambda function?

Please see our [documentation](http://docs.aws.amazon.com/lambda/latest/dg/intro-core-components.html#intro-core-components-event-sources) for a complete list of event sources.

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Q: When should I use AWS Lambda versus Amazon EC2?

Amazon Web Services offers a set of compute services to meet a range of needs.

[Amazon EC2](https://aws.amazon.com/ec2/) offers flexibility, with a wide range of instance types and the option to customize the operating system, network and security settings, and the entire software stack, allowing you to easily move existing applications to the cloud. With Amazon EC2 you are responsible for provisioning capacity, monitoring fleet health and performance, and designing for fault tolerance and scalability. [AWS Elastic Beanstalk](https://aws.amazon.com/elasticbeanstalk/) offers an easy-to-use service for deploying and scaling web applications in which you retain ownership and full control over the underlying EC2 instances. [Amazon EC2 Container Service](https://aws.amazon.com/ecs/) is a scalable management service that supports Docker containers and allows you to easily run distributed applications on a managed cluster of Amazon EC2 instances.

AWS Lambda makes it easy to execute code in response to events, such as changes to Amazon S3 buckets, updates to an Amazon DynamoDB table, or custom events generated by your applications or devices. With Lambda you do not have to provision your own instances; Lambda performs all the operational and administrative activities on your behalf, including capacity provisioning, monitoring fleet health, applying security patches to the underlying compute resources, deploying your code, running a web service front end, and monitoring and logging your code. AWS Lambda provides easy scaling and high availability to your code without additional effort on your part.

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Q: What kind of code can run on AWS Lambda?

AWS Lambda offers an easy way to accomplish many activities in the cloud. For example, you can use AWS Lambda to build mobile back-ends that retrieve and transform data from Amazon DynamoDB, handlers that compress or transform objects as they are uploaded to Amazon S3, auditing and reporting of API calls made to any Amazon Web Service, and server-less processing of streaming data using Amazon Kinesis.

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Q: What languages does AWS Lambda support?

AWS Lambda natively supports Java, Go, PowerShell, Node.js, C#, Python, and Ruby code, and provides a Runtime API which allows you to use any additional programming languages to author your functions. Please read our documentation on using [Node.js](http://docs.aws.amazon.com/lambda/latest/dg/authoring-function-in-nodejs.html), [Python](http://docs.aws.amazon.com/lambda/latest/dg/python-lambda.html), [Java](http://docs.aws.amazon.com/lambda/latest/dg/java-lambda.html), [Ruby](https://docs.aws.amazon.com/lambda/latest/dg/lambda-runtimes.html), [C#](http://docs.aws.amazon.com/lambda/latest/dg/current-supported-versions.html), [Go](https://docs.aws.amazon.com/lambda/latest/dg/go-programming-model.html) and [PowerShell](https://docs.aws.amazon.com/lambda/latest/dg/powershell-programming-model.html).

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Q: Can I access the infrastructure that AWS Lambda runs on?

No. AWS Lambda operates the compute infrastructure on your behalf, allowing it to perform health checks, apply security patches, and do other routine maintenance.

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Q: How does AWS Lambda isolate my code?

Each AWS Lambda function runs in its own isolated environment, with its own resources and file system view. AWS Lambda uses the same techniques as Amazon EC2 to provide security and separation at the infrastructure and execution levels.

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Q: How does AWS Lambda secure my code?

AWS Lambda stores code in Amazon S3 and encrypts it at rest. AWS Lambda performs additional integrity checks while your code is in use.

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Q: What AWS regions are available for AWS Lambda?

Please refer to the [AWS Global Infrastructure Region Table](https://aws.amazon.com/about-aws/global-infrastructure/regional-product-services/).

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## **AWS Lambda functions**

Q: What is an AWS Lambda function?

The code you run on AWS Lambda is uploaded as a “Lambda function”. Each function has associated configuration information, such as its name, description, entry point, and resource requirements. The code must be written in a “stateless” style i.e. it should assume there is no affinity to the underlying compute infrastructure. Local file system access, child processes, and similar artifacts may not extend beyond the lifetime of the request, and any persistent state should be stored in Amazon S3, Amazon DynamoDB, or another Internet-available storage service. Lambda functions can include libraries, even native ones.

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Q: Will AWS Lambda reuse function instances?

To improve performance, AWS Lambda may choose to retain an instance of your function and reuse it to serve a subsequent request, rather than creating a new copy. To learn more about how Lambda reuses function instances, visit our [documentation](http://docs.aws.amazon.com/lambda/latest/dg/lambda-introduction.html). Your code should not assume that this will always happen.

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Q: What if I need scratch space on disk for my AWS Lambda function?

Each Lambda function receives 500MB of non-persistent disk space in its own /tmp directory.

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Q: Why must AWS Lambda functions be stateless?

Keeping functions stateless enables AWS Lambda to rapidly launch as many copies of the function as needed to scale to the rate of incoming events. While AWS Lambda’s programming model is stateless, your code can access stateful data by calling other web services, such as Amazon S3 or Amazon DynamoDB.

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Q: Can I use threads and processes in my AWS Lambda function code?

Yes. AWS Lambda allows you to use normal language and operating system features, such as creating additional threads and processes. Resources allocated to the Lambda function, including memory, execution time, disk, and network use, must be shared among all the threads/processes it uses. You can launch processes using any language supported by Amazon Linux.

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Q: What restrictions apply to AWS Lambda function code?

Lambda attempts to impose as few restrictions as possible on normal language and operating system activities, but there are a few activities that are disabled: Inbound network connections are blocked by AWS Lambda, and for outbound connections only TCP/IP and UDP/IP sockets are supported, and ptrace (debugging) system calls are blocked. TCP port 25 traffic is also blocked as an anti-spam measure.

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Q: How do I create an AWS Lambda function using the Lambda console?

If you are using Node.js or Python, you can author the code for your function using code editor in the AWS Lambda console which lets you author and test your functions, and view the results of function executions in a robust, IDE-like environment. [Go to the console to get started](https://console.aws.amazon.com/lambda/home?region=us-east-1).

You can also package the code (and any dependent libraries) as a ZIP and upload it using the AWS Lambda console from your local environment or specify an Amazon S3 location where the ZIP file is located. Uploads must be no larger than 50MB (compressed). You can use the AWS Eclipse plugin to author and deploy Lambda functions in Java. You can use the Visual Studio plugin to author and deploy Lambda functions in C#, and Node.js.

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Q: How do I create an AWS Lambda function using the Lambda CLI?

You can package the code (and any dependent libraries) as a ZIP and upload it using the AWS CLI from your local environment, or specify an Amazon S3 location where the ZIP file is located. Uploads must be no larger than 50MB (compressed). Visit the [Lambda Getting Started guide](http://docs.aws.amazon.com/lambda/latest/dg/getting-started.html) to get started.

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Q: Does AWS Lambda support environment variables?

Yes. You can easily create and modify environment variables from the AWS Lambda Console, CLI or SDKs. To learn more about environment variables, see the [documentation](http://docs.aws.amazon.com/lambda/latest/dg/env_variables.html).

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Q: Can I store sensitive information in environment variables?

For sensitive information, such as database passwords, we recommend you use client-side encryption using [AWS Key Management Service](http://docs.aws.amazon.com/kms/latest/developerguide/overview.html) and store the resulting values as ciphertext in your environment variable. You will need to include logic in your AWS Lambda function code to decrypt these values.

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Q: How can I manage my AWS Lambda functions?

You can easily list, delete, update, and monitor your Lambda functions using the dashboard in the AWS Lambda console. You can also use the AWS CLI and AWS SDK to manage your Lambda functions. Visit the [Lambda Developer Guide](http://docs.aws.amazon.com/lambda/latest/dg/welcome.html) to learn more.

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Q: Can I share code across functions?

Yes, you can package any code (frameworks, SDKs, libraries, and more) as a [Lambda Layer](https://docs.aws.amazon.com/lambda/latest/dg/configuration-layers.html) and manage and share them easily across multiple functions.

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Q: How do I monitor an AWS Lambda function?

AWS Lambda automatically monitors Lambda functions on your behalf, reporting real-time metrics through Amazon CloudWatch, including total requests, account-level and function-level concurrency usage, latency, error rates, and throttled requests. You can view statistics for each of your Lambda functions via the Amazon CloudWatch console or through the AWS Lambda console. You can also call third-party monitoring APIs in your Lambda function.

Visit [Troubleshooting CloudWatch metrics](http://docs.aws.amazon.com/lambda/latest/dg/monitoring-functions.html) to learn more. Standard charges for AWS Lambda apply to use Lambda’s built-in metrics.

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Q: How do I troubleshoot failures in an AWS Lambda function?

AWS Lambda automatically integrates with Amazon CloudWatch logs, creating a log group for each Lambda function and providing basic application lifecycle event log entries, including logging the resources consumed for each use of that function. You can easily insert additional logging statements into your code. You can also call third-party logging APIs in your Lambda function. Visit [Troubleshooting Lambda functions](http://docs.aws.amazon.com/lambda/latest/dg/monitoring-functions.html) to learn more. Amazon CloudWatch Logs rates will apply.

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Q: How do I scale an AWS Lambda function?

You do not have to scale your Lambda functions – AWS Lambda scales them automatically on your behalf. Every time an event notification is received for your function, AWS Lambda quickly locates free capacity within its compute fleet and runs your code. Since your code is stateless, AWS Lambda can start as many copies of your function as needed without lengthy deployment and configuration delays. There are no fundamental limits to scaling a function. AWS Lambda will dynamically allocate capacity to match the rate of incoming events.

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Q: How are compute resources assigned to an AWS Lambda function?

In the AWS Lambda resource model, you choose the amount of memory you want for your function, and are allocated proportional CPU power and other resources. For example, choosing 256MB of memory allocates approximately twice as much CPU power to your Lambda function as requesting 128MB of memory and half as much CPU power as choosing 512MB of memory. To learn more, see our [Function Configuration documentation](https://docs.aws.amazon.com/lambda/latest/dg/resource-model.html).  
  
You can set your memory in 64MB increments from 128MB to 3GB.

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Q: How long can an AWS Lambda function execute?

AWS Lambda functions can be configured to run up to 15 minutes per execution. You can set the timeout to any value between 1 second and 15 minutes.

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Q: How will I be charged for using AWS Lambda functions?

AWS Lambda is priced on a pay per use basis. Please see the [AWS Lambda pricing page](https://aws.amazon.com/lambda/pricing/) for details.

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Q: Does AWS Lambda support versioning?

Yes. By default, each AWS Lambda function has a single, current version of the code. Clients of your Lambda function can call a specific version or get the latest implementation. Please read out documentation on [versioning Lambda functions](http://docs.aws.amazon.com/lambda/latest/dg/versioning-aliases.html).

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Q: How long after uploading my code will my AWS Lambda function be ready to call?

Deployment times may vary with the size of your code, but AWS Lambda functions are typically ready to call within seconds of upload.

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Q: Can I use my own version of a supported library?

Yes. you can include your own copy of a library (including the AWS SDK) in order to use a different version than the default one provided by AWS Lambda.

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## **Using AWS Lambda to process AWS events**

Q: What is an event source?

An event source is an AWS service or developer-created application that produces events that trigger an AWS Lambda function to run. Some services publish these events to Lambda by invoking the cloud function directly (for example, Amazon S3). Lambda can also poll resources in other services that do not publish events to Lambda. For example, Lambda can pull records from an Amazon Kinesis stream or an Amazon SQS queue and execute a Lambda function for each fetched message.

Many other services, such as AWS CloudTrail, can act as event sources simply by logging to Amazon S3 and using S3 bucket notifications to trigger AWS Lambda functions.

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Q: What event sources can be used with AWS Lambda?

Please see our [documentation](http://docs.aws.amazon.com/lambda/latest/dg/intro-core-components.html#intro-core-components-event-sources) for a complete list of event sources.

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Q: How are events represented in AWS Lambda?

Events are passed to a Lambda function as an event input parameter. For event sources where events arrive in batches, such as Amazon SQS, Amazon Kinesis, and Amazon DynamoDB Streams, the event parameter may contain multiple events in a single call, based on the batch size you request.To learn more about Amazon S3 event notifications visit [Configuring Notifications for Amazon S3 Events](http://docs.aws.amazon.com/AmazonS3/latest/dev/NotificationHowTo.html). To learn more about Amazon DynamoDB Streams visit the [DynamoDB Stream Developers Guide](http://docs.aws.amazon.com/amazondynamodb/latest/developerguide/Streams.html). To learn more about invoking Lambda functions using Amazon SNS, visit the [Amazon SNS Developers Guide](http://docs.aws.amazon.com/sns/latest/dg/sns-lambda.html). For more information on Amazon Cognito events, visit [Amazon Cognito](https://aws.amazon.com/cognito/). For more information on AWS CloudTrail logs and auditing API calls across AWS services, see [AWS CloudTrail](https://aws.amazon.com/cloudtrail/).

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Q: How do I make an AWS Lambda function respond to changes in an Amazon S3 bucket?

From the AWS Lambda console, you can select a function and associate it with notifications from an Amazon S3 bucket. Alternatively, you can use the Amazon S3 console and configure the bucket’s notifications to send to your AWS Lambda function. This same functionality is also available through the AWS SDK and CLI.

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Q: How do I make an AWS Lambda function respond to updates in an Amazon DynamoDB table?

You can trigger a Lambda function on DynamoDB table updates by subscribing your Lambda function to the DynamoDB Stream associated with the table. You can associate a DynamoDB Stream with a Lambda function using the Amazon DynamoDB console, the AWS Lambda console or Lambda’s registerEventSource API.

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Q: How do I use an AWS Lambda function to process records in an Amazon Kinesis stream?

From the AWS Lambda console, you can select a Lambda function and associate it with an Amazon Kinesis stream owned by the same account. This same functionality is also available through the AWS SDK and CLI.

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Q: How does AWS Lambda process data from Amazon Kinesis streams and Amazon DynamoDB Streams?

The Amazon Kinesis and DynamoDB Streams records sent to your AWS Lambda function are strictly serialized, per shard. This means that if you put two records in the same shard, Lambda guarantees that your Lambda function will be successfully invoked with the first record before it is invoked with the second record. If the invocation for one record times out, is throttled, or encounters any other error, Lambda will retry until it succeeds (or the record reaches its 24-hour expiration) before moving on to the next record. The ordering of records across different shards is not guaranteed, and processing of each shard happens in parallel.

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Q: How do I use an AWS Lambda function to respond to notifications sent by Amazon Simple Notification Service (SNS)?

From the AWS Lambda console, you can select a Lambda function and associate it with an Amazon SNS topic. This same functionality is also available through the AWS SDK and CLI.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I use an AWS Lambda function to respond to emails sent by Amazon Simple Email Service (SES)?

From the Amazon SES Console, you can set up your receipt rule to have Amazon SES deliver your messages to an AWS Lambda function. The same functionality is available through the AWS SDK and CLI.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I use an AWS Lambda function to respond to Amazon CloudWatch alarms?

First, configure the alarm to send Amazon SNS notifications. Then from the AWS Lambda console, select a Lambda function and associate it with that Amazon SNS topic. See the [Amazon CloudWatch Developer Guide](http://docs.aws.amazon.com/AmazonCloudWatch/latest/DeveloperGuide/WhatIsCloudWatch.html) for more on setting up Amazon CloudWatch alarms.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I use an AWS Lambda function to respond to changes in user or device data managed by Amazon Cognito?

From the AWS Lambda console, you can select a function to trigger when any datasets associated with an [Amazon Cognito](https://aws.amazon.com/cognito/) identity pool are synchronized. This same functionality is also available through the AWS SDK and CLI. Visit Amazon Cognito for more information on using Amazon Cognito to share and synchronize data across a user’s devices.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How can my application trigger an AWS Lambda function directly?

You can invoke a Lambda function using a custom event through AWS Lambda’s invoke API. Only the function’s owner or another AWS account that the owner has granted permission can invoke the function. Visit the [Lambda Developers Guide](http://docs.aws.amazon.com/lambda/latest/dg/welcome.html) to learn more.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: What is the latency of invoking an AWS Lambda function in response to an event?

AWS Lambda is designed to process events within milliseconds. Latency will be higher immediately after a Lambda function is created, updated, or if it has not been used recently.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I create a mobile back-end using AWS Lambda?

You upload the code you want AWS Lambda to execute and then invoke it from your mobile app using the AWS Lambda SDK included in the AWS Mobile SDK. You can make both direct (synchronous) calls to retrieve or check data in real time as well as asynchronous calls. You can also define a custom API using Amazon API Gateway and invoke your Lambda functions through any REST compatible client. To learn more about the AWS Mobile SDK, visit the [AWS Mobile SDK](https://aws.amazon.com/mobile/sdk/)page. To learn more about Amazon API Gateway, visit the [Amazon API Gateway](https://aws.amazon.com/api-gateway/) page.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I invoke an AWS Lambda function over HTTPS?

You can invoke a Lambda function over HTTPS by defining a custom RESTful API using Amazon API Gateway. This gives you an endpoint for your function which can respond to REST calls like GET, PUT and POST. Read more about using AWS Lambda with Amazon API Gateway.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How can my AWS Lambda function customize its behavior to the device and app making the request?

When called through the AWS Mobile SDK, AWS Lambda functions automatically gain insight into the device and application that made the call through the ‘context’ object.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How can my AWS Lambda function personalize their behavior based on the identity of the end user of an application?

When your app uses the Amazon Cognito identity, end users can authenticate themselves using a variety of public login providers such as Amazon, Facebook, Google, and other OpenID Connect-compatible services. User identity is then automatically and secured presented to your Lambda function in the form of an Amazon Cognito id, allowing it to access user data from Amazon Cognito, or as a key to store and retrieve data in Amazon DynamoDB or other web services.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I create an Alexa skill using AWS Lambda?

AWS Lambda is integrated with the Alexa Skills Kit, a collection of self-service APIs, tools, documentation and code samples that make it easy for you to create voice-driven capabilities (or “skills”) for Alexa. You simply upload the Lambda function code for the new Alexa skill you are creating, and AWS Lambda does the rest, executing the code in response to Alexa voice interactions and automatically managing the compute resources on your behalf. Read the Alexa Skills Kit documentation for more details.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: What happens if my function fails while processing an event?

For Amazon S3 bucket notifications and custom events, AWS Lambda will attempt execution of your function three times in the event of an error condition in your code or if you exceed a service or resource limit.   
  
For ordered event sources that AWS Lambda polls on your behalf, such as Amazon DynamoDB Streams and Amazon Kinesis streams, Lambda will continue attempting execution in the event of a developer code error until the data expires. You can monitor progress through the Amazon Kinesis and Amazon DynamoDB consoles and through the Amazon CloudWatch metrics that AWS Lambda generates for your function. You can also set Amazon CloudWatch alarms based on error or execution throttling rates.

[Show less](https://aws.amazon.com/lambda/faqs/)

## **Using AWS Lambda to build applications**

Q: What is a serverless application?

Lambda-based applications (also referred to as serverless applications) are composed of functions triggered by events. A typical serverless application consists of one or more functions triggered by events such as object uploads to Amazon S3, Amazon SNS notifications, or API actions. These functions can stand alone or leverage other resources such as DynamoDB tables or Amazon S3 buckets. The most basic serverless application is simply a function.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I deploy and manage a serverless application?

You can deploy and manage your serverless applications using the AWS Serverless Application Model (AWS SAM). AWS SAM is a specification that prescribes the rules for expressing serverless applications on AWS. This specification aligns with the syntax used by AWS CloudFormation today and is supported natively within AWS CloudFormation as a set of resource types (referred to as "serverless resources"). These resources make it easier for AWS customers to use CloudFormation to configure and deploy serverless applications, using existing CloudFormation APIs.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How can I discover existing serverless applications developed by the AWS community?

You can choose from a collection of serverless applications published by developers, companies, and partners in the AWS community with the [AWS Serverless Application Repository](https://aws.amazon.com/serverless/serverlessrepo/). After finding an application, you can configure and deploy it straight from the [Lambda console](https://console.aws.amazon.com/lambda/home?region=us-east-1).

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I automate deployment for a serverless application?

You can automate your serverless application’s release process using AWS CodePipeline and AWS CodeDeploy. CodePipeline is a continuous delivery service that enables you to model, visualize and automate the steps required to release your serverless application. CodeDeploy provides a deployment automation engine for your Lambda-based applications. CodeDeploy lets you orchestrate deployments according to established best-practice methodologies such as canary and linear deployments, and helps you establish the necessary guardrails to verify that newly-deployed code is safe, stable, and ready to be fully released to production.

To learn more about serverless CI/CD, visit our [documentation](http://docs.aws.amazon.com/lambda/latest/dg/automating-deployment.html).

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I get started on building a serverless application?

To get started, visit the AWS Lambda console and download one of our blueprints. The file you download will contain an AWS SAM file (which defines the AWS resources in your application), and a .ZIP file (which includes your function’s code). You can then use AWS CloudFormation commands to package and deploy the serverless application that you just downloaded. For more details, visit our [documentation](http://docs.aws.amazon.com/lambda/latest/dg/deploying-lambda-apps.html).

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I coordinate calls between multiple AWS Lambda functions?

You can use [AWS Step Functions](https://aws.amazon.com/step-functions/) to coordinate a series of AWS Lambda functions in a specific order. You can invoke multiple Lambda functions sequentially, passing the output of one to the other, and/or in parallel, and Step Functions will maintain state during executions for you.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I troubleshoot a serverless application?

You can enable your Lambda function for tracing with [AWS X-Ray](https://aws.amazon.com/xray/) by adding X-Ray permissions to your Lambda function’s execution role and changing your function’s “tracing mode” to “active. ” When X-Ray is enabled for your Lambda function, AWS Lambda will emit tracing information to X-Ray regarding the Lambda service overhead incurred when invoking your function. This will provide you with insights such as Lambda service overhead, function init time, and function execution time. In addition, you can include the X-Ray SDK in your Lambda deployment package to create your own trace segments, annotate your traces, or view trace segments for downstream calls made from your Lambda function. X-Ray SDKs are currently available for Node.js and Java. Visit [Troubleshooting Lambda-based applications](http://docs.aws.amazon.com/lambda/latest/dg/lambda-x-ray.html) to learn more. AWS X-Ray rates will apply.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How is AWS SAM licensed?

The specification is open sourced under Apache 2.0, which allows you and others to adopt and incorporate AWS SAM into build, deployment, monitoring and management tools with a commercial-friendly license. You can access the AWS SAM repository on GitHub [here](https://github.com/awslabs/serverless-application-specification).

[Show less](https://aws.amazon.com/lambda/faqs/)

## **Lambda@Edge**

Q: What is Lambda@Edge?

[Lambda@Edge](https://aws.amazon.com/lambda/edge/) allows you to run code across AWS locations globally without provisioning or managing servers, responding to end users at the lowest network latency. You just upload your Node.js code to AWS Lambda and configure your function to be triggered in response to [Amazon CloudFront](https://aws.amazon.com/cloudfront/) requests (i.e., when a viewer request lands, when a request is forwarded to or received back from the origin, and right before responding back to the end user). The code is then ready to execute across AWS locations globally when a request for content is received, and scales with the volume of CloudFront requests globally. Learn more in our [documentation](http://docs.aws.amazon.com/AmazonCloudFront/latest/DeveloperGuide/lambda-at-the-edge.html).

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I use Lambda@Edge?

To use Lambda@Edge, you just upload your code to AWS Lambda and associate a function version to be triggered in response to Amazon CloudFront requests. Your code must satisfy the Lambda@Edge service limits. Lambda@Edge only supports Node.js for global invocation by CloudFront events at this time. Learn more in our [documentation](http://docs.aws.amazon.com/AmazonCloudFront/latest/DeveloperGuide/lambda-at-the-edge.html).

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: When should I use Lambda@Edge?

Lambda@Edge is optimized for latency sensitive use cases where your end viewers are distributed globally. All the information you need to make a decision should be available at the CloudFront edge, within the function and the request. This means that use cases where you are looking to make decisions on how to serve content based on user characteristics (e.g., location, client device, etc) can now be executed and served close to your users without having to be routed back to a centralized server.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: Can I deploy my existing Lambda functions for global invocation?

You can associate existing Lambda functions with CloudFront events for global invocation if the function satisfies the Lambda@Edge service requirements and limits. Read more [here](http://docs.aws.amazon.com/lambda/latest/dg/API_UpdateFunctionConfiguration.html) on how to update your function properties.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: What Amazon CloudFront events can be used to trigger my functions?

Your functions will automatically trigger in response to the following Amazon CloudFront events:

* Viewer Request - This event occurs when an end user or a device on the Internet makes an HTTP(S) request to CloudFront, and the request arrives at the edge location closest to that user.
* Viewer Response - This event occurs when the CloudFront server at the edge is ready to respond to the end user or the device that made the request.
* Origin Request - This event occurs when the CloudFront edge server does not already have the requested object in its cache, and the viewer request is ready to be sent to your backend origin webserver (e.g. Amazon EC2, or Application Load Balancer, or Amazon S3).
* Origin Response - This event occurs when the CloudFront server at the edge receives a response from your backend origin webserver.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How is AWS Lambda@Edge different from using AWS Lambda behind Amazon API Gateway?

The difference is that API Gateway and Lambda are regional services. Using [Lambda@Edge](https://aws.amazon.com/lambda/edge/) and [Amazon CloudFront](https://aws.amazon.com/cloudfront/)allows you to execute logic across multiple AWS locations based on where your end viewers are located.

[Show less](https://aws.amazon.com/lambda/faqs/)

## **Scalability and availability**

Q: How available are AWS Lambda functions?

AWS Lambda is designed to use replication and redundancy to provide high availability for both the service itself and for the Lambda functions it operates. There are no maintenance windows or scheduled downtimes for either.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: Do my AWS Lambda functions remain available when I change my code or its configuration?

Yes. When you update a Lambda function, there will be a brief window of time, typically less than a minute, when requests could be served by either the old or the new version of your function.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: Is there a limit to the number of AWS Lambda functions I can execute at once?

No. AWS Lambda is designed to run many instances of your functions in parallel. However, AWS Lambda has a default safety throttle for number of concurrent executions per account per region (visit [here](http://docs.aws.amazon.com/lambda/latest/dg/concurrent-executions.html#concurrent-execution-safety-limit) for info on default safety throttle limits). You can also control the maximum concurrent executions for individual AWS Lambda functions which you can use to reserve a subset of your account concurrency limit for critical functions, or cap traffic rates to downstream resources.  
  
If you wish to submit a request to increase the throttle limit you can visit our [Support Center](https://aws.amazon.com/support), click "Open a new case," and file a service limit increase request.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: What happens if my account exceeds the default throttle limit on concurrent executions?

On exceeding the throttle limit, AWS Lambda functions being invoked synchronously will return a throttling error (429 error code). Lambda functions being invoked asynchronously can absorb reasonable bursts of traffic for approximately 15-30 minutes, after which incoming events will be rejected as throttled. In case the Lambda function is being invoked in response to Amazon S3 events, events rejected by AWS Lambda may be retained and retried by S3 for 24 hours. Events from Amazon Kinesis streams and Amazon DynamoDB streams are retried until the Lambda function succeeds or the data expires. Amazon Kinesis and Amazon DynamoDB Streams retain data for 24 hours.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: Is the default limit applied on a per function level?

No, the default limit only applies at an account level.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: What happens if my Lambda function fails during processing an event?

On failure, Lambda functions being invoked synchronously will respond with an exception. Lambda functions being invoked asynchronously are retried at least 3 times. Events from Amazon Kinesis streams and Amazon DynamoDB streams are retried until the Lambda function succeeds or the data expires. Kinesis and DynamoDB Streams retain data for a minimum of 24 hours.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: What happens if my Lambda function invocations exhaust the available policy?

On exceeding the retry policy for asynchronous invocations, you can configure a “dead letter queue” (DLQ) into which the event will be placed; in the absence of a configured DLQ the event may be rejected. On exceeding the retry policy for stream based invocations, the data would have already expired and therefore rejected.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: What resources can I configure as a dead letter queue for a Lambda function?

You can configure an Amazon SQS queue or an Amazon SNS topic as your dead letter queue.

[Show less](https://aws.amazon.com/lambda/faqs/)

## **Security and access control**

Q: How do I allow my AWS Lambda function access to other AWS resources?

You grant permissions to your Lambda function to access other resources using an IAM role. AWS Lambda assumes the role while executing your Lambda function, so you always retain full, secure control of exactly which AWS resources it can use. Visit [Setting up AWS Lambda](http://docs.aws.amazon.com/lambda/latest/dg/setting-up.html) to learn more about roles.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I control which Amazon S3 buckets can call which AWS Lambda functions?

When you configure an Amazon S3 bucket to send messages to an AWS Lambda function a resource policy rule will a be created that grants access. Visit the [Lambda Developer's Guide](http://docs.aws.amazon.com/lambda/latest/dg/welcome.html) to learn more about resource policies and access controls for Lambda functions.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I control which Amazon DynamoDB table or Amazon Kinesis stream an AWS Lambda function can poll?

Access controls are managed through the Lambda function’s role. The role you assign to your Lambda function also determines which resource(s) AWS Lambda can poll on its behalf. Visit the [Lambda Developer's Guide](http://docs.aws.amazon.com/lambda/latest/dg/welcome.html) to learn more.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I control which Amazon SQS queue an AWS Lambda function can poll?

Access controls can be managed by the Lambda function’s role or a resource policy setting on the queue itself. If both policies are present, the more restrictive of the two permissions will be applied.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: Can I access resources behind Amazon VPC with my AWS Lambda function?

Yes. You can access resources behind Amazon VPC.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I enable and disable the VPC support for my Lambda function?

To enable VPC support, you need to specify one or more subnets in a single VPC and a security group as part of your function configuration. To disable VPC support, you need to update the function configuration and specify an empty list for the subnet and security group. You can change these settings using the AWS APIs, CLI, or AWS Lambda Management Console.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: Can a single Lambda function have access to multiple VPCs?

No. Lambda functions provide access only to a single VPC. If multiple subnets are specified, they must all be in the same VPC. You can connect to other VPCs by peering your VPCs.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: Can Lambda functions in a VPC also be able to access the internet and AWS Service endpoints?

Lambda functions configured to access resources in a particular VPC will not have access to the internet as a default configuration. If you need access to external endpoints, you will need to create a [NAT](http://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/vpc-nat-gateway.html) in your VPC to forward this traffic and configure your security group to allow this outbound traffic.

[Show less](https://aws.amazon.com/lambda/faqs/)

## **AWS Lambda functions in Java**

Q: How do I compile my AWS Lambda function Java code?

You can use standard tools like Maven or Gradle to compile your Lambda function. Your build process should mimic the same build process you would use to compile any Java code that depends on the AWS SDK. Run your Java compiler tool on your source files and include the AWS SDK 1.9 or later with transitive dependencies on your classpath. For more details, see our [documentation](http://docs.aws.amazon.com/lambda/latest/dg/java-lambda.html).

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: What is the JVM environment Lambda uses for execution of my function?

Lambda provides the Amazon Linux build of openjdk 1.8.

[Show less](https://aws.amazon.com/lambda/faqs/)

## **AWS Lambda functions in Node.js**

[Q: Can I use packages with AWS Lambda? »](https://aws.amazon.com/lambda/faqs/)

[Q: Can I execute other programs from within my AWS Lambda function written in Node.js? »](https://aws.amazon.com/lambda/faqs/)

[Q: Is it possible to use native modules with AWS Lambda functions written in Node.js? »](https://aws.amazon.com/lambda/faqs/)

[Q: Can I execute binaries with AWS Lambda written in Node.js? »](https://aws.amazon.com/lambda/faqs/)

[Q: How do I deploy AWS Lambda function code written in Node.js? »](https://aws.amazon.com/lambda/faqs/)

## **AWS Lambda functions in Python**

[Q: Can I use Python packages with AWS Lambda? »](https://aws.amazon.com/lambda/faqs/)

## **AWS Lambda functions in C#**

[Q: How do I package and deploy an AWS Lambda function in C#? »](https://aws.amazon.com/lambda/faqs/)

## **AWS Lambda functions in PowerShell**

[Q: How do I deploy AWS Lambda function code written in PowerShell? »](https://aws.amazon.com/lambda/faqs/)

Q: How do I deploy AWS Lambda function code written in PowerShell?  A PowerShell Lambda deployment package is a ZIP file that contains your PowerShell script, PowerShell modules that are required for your PowerShell script, and the assemblies needed to host PowerShell Core. You then use the *AWSLambdaPSCore* PowerShell module that you can install from the PowerShell Gallery to create your PowerShell Lambda deployment package.

Q: How do I deploy AWS Lambda function code written in PowerShell?  A PowerShell Lambda deployment package is a ZIP file that contains your PowerShell script, PowerShell modules that are required for your PowerShell script, and the assemblies needed to host PowerShell Core. You then use the *AWSLambdaPSCore* PowerShell module that you can install from the PowerShell Gallery to create your PowerShell Lambda deployment package.

## [**AWS Lambda functions in Go**](https://aws.amazon.com/lambda/faqs/)

[Q: How do I package and deploy an AWS Lambda function in Go? »](https://aws.amazon.com/lambda/faqs/)

## [**AWS Lambda functions in Ruby**](https://aws.amazon.com/lambda/faqs/)

[Q: How do I deploy AWS Lambda function code written in Ruby? »](https://aws.amazon.com/lambda/faqs/)

## **Other topics**

[Q: Which versions of Amazon Linux, Node.js, Python, JDK, .NET Core, SDKs, and additional libraries does AWS Lambda support? »](https://aws.amazon.com/lambda/faqs/)

Q: Can I change the version of Amazon Linux or any language runtime?

No. AWS Lambda offers a single version of the operating system and managed language runtime to all users of the service. You can [bring your own language runtime](https://docs.amazon.com/lambda/latest/dg/runtimes-custom.html) to use in Lambda.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How can I record and audit calls made to the AWS Lambda API?

AWS Lambda is integrated with AWS CloudTrail. AWS CloudTrail can record and deliver log files to your Amazon S3 bucket describing the API usage of your account.

[Show less](https://aws.amazon.com/lambda/faqs/)

Q: How do I coordinate calls between multiple Lambda functions?

You can use Amazon Step Functions to coordinate multiple invoking Lambda functions. You can invoke multiple Lambda functions serially, passing the output of one to the other, or in parallel. See our [documentation](http://docs.aws.amazon.com/step-functions/latest/dg/hello-lambda.html) for more details.

[Show less](https://aws.amazon.com/lambda/faqs/)

# Building Lambda Functions

You upload your application code in the form of one or more Lambda functions to AWS Lambda, a compute service. In turn, AWS Lambda executes the code on your behalf. AWS Lambda takes care of provisioning and managing the servers to run the code upon invocation.

Typically, the lifecycle for an AWS Lambda-based application includes authoring code, deploying code to AWS Lambda, and then monitoring and troubleshooting. The following are general questions that come up in each of these lifecycle phases:

* **Authoring code for your Lambda function** – What languages are supported? Is there a programming model that I need to follow? How do I package my code and dependencies for uploading to AWS Lambda? What tools are available?
* **Uploading code and creating Lambda functions** – How do I upload my code package to AWS Lambda? How do I tell AWS Lambda where to begin executing my code? How do I specify compute requirements like memory and timeout?
* **Monitoring and troubleshooting** – For my Lambda function that is in production, what metrics are available? If there are any failures, how do I get logs or troubleshoot issues?

The following sections provide introductory information and the Example section at the end provides working examples for you to explore.

## Authoring Code for Your Lambda Function

You can author your Lambda function code in the languages that are supported by AWS Lambda. For a list of supported languages, see [AWS Lambda Runtimes](https://docs.aws.amazon.com/lambda/latest/dg/lambda-runtimes.html). There are tools for authoring code, such as the AWS Lambda console, Eclipse IDE, and Visual Studio IDE. But the available tools and options depend on the following:

* Language you choose to write your Lambda function code.
* Libraries that you use in your code. AWS Lambda runtime provides some of the libraries and you must upload any additional libraries that you use.

The following table lists languages, and the available tools and options that you can use.

|  |  |
| --- | --- |
| **Language** | **Tools and Options for Authoring Code** |
| Node.js | * AWS Lambda console * Visual Studio, with IDE plug-in (see [AWS Lambda Support in Visual Studio](https://aws.amazon.com/blogs/developer/aws-lambda-support-in-visual-studio/)) * Your own authoring environment * For more information, see [Deploying Code and Creating a Lambda Function](https://docs.aws.amazon.com/lambda/latest/dg/lambda-app.html#lambda-app-deploy). |
| Java | * Eclipse, with AWS Toolkit for Eclipse (see [Using AWS Lambda with the AWS Toolkit for Eclipse](https://docs.aws.amazon.com/AWSToolkitEclipse/latest/ug/lambda.html)) * Your own authoring environment * For more information, see [Deploying Code and Creating a Lambda Function](https://docs.aws.amazon.com/lambda/latest/dg/lambda-app.html#lambda-app-deploy). |
| C# | * Visual Studio, with IDE plug-in (see [AWS Lambda Support in Visual Studio](https://aws.amazon.com/visualstudio/)) * .NET Core (see [.NET Core installation guide](https://www.microsoft.com/net/core)) * Your own authoring environment * For more information, see [Deploying Code and Creating a Lambda Function](https://docs.aws.amazon.com/lambda/latest/dg/lambda-app.html#lambda-app-deploy). |
| Python | * AWS Lambda console * Your own authoring environment * For more information, see [Deploying Code and Creating a Lambda Function](https://docs.aws.amazon.com/lambda/latest/dg/lambda-app.html#lambda-app-deploy). |
| Go | * Your own authoring environment * For more information, see [Deploying Code and Creating a Lambda Function](https://docs.aws.amazon.com/lambda/latest/dg/lambda-app.html#lambda-app-deploy). |
| PowerShell | * Your own authoring environment * PowerShell Core 6.0 (see [Installing PowerShell Core](https://docs.microsoft.com/en-us/powershell/scripting/setup/installing-powershell)) * .NET Core 2.1 SDK (see [.NET downloads](https://www.microsoft.com/net/download)) * AWSLambdaPSCore Module (see [PowerShell Gallery](https://www.powershellgallery.com/packages/AWSLambdaPSCore)) |

In addition, regardless of the language you choose, there is a pattern to writing Lambda function code. For example, how you write the handler method of your Lambda function (that is, the method that AWS Lambda first calls when it begins executing the code), how you pass events to the handler, what statements you can use in your code to generate logs in CloudWatch Logs, how to interact with AWS Lambda runtime and obtain information such as the time remaining before timeout, and how to handle exceptions. The [Programming Model](https://docs.aws.amazon.com/lambda/latest/dg/programming-model-v2.html) section provides information for each of the supported languages.

## Deploying Code and Creating a Lambda Function

To create a Lambda function, you first package your code and dependencies in a deployment package. Then, you upload the deployment package to AWS Lambda to create your Lambda function.

**Topics**

* [Creating a Deployment Package](https://docs.aws.amazon.com/lambda/latest/dg/lambda-app.html#lambda-app-structure-code)
* [Uploading a Deployment Package](https://docs.aws.amazon.com/lambda/latest/dg/lambda-app.html#lambda-app-upload-deployment-pkg)
* [Testing a Lambda Function](https://docs.aws.amazon.com/lambda/latest/dg/lambda-app.html#lambda-app-test-code)

### Creating a Deployment Package

You must first organize your code and dependencies in certain ways and create a deployment package. Instructions to create a deployment package vary depending on the language you choose to author the code. For example, you can use build plugins such as Jenkins (for Node.js and Python), and Maven (for Java) to create the deployment packages. For more information, see [Creating a Deployment Package](https://docs.aws.amazon.com/lambda/latest/dg/deployment-package-v2.html).

When you create Lambda functions using the console, the console creates the deployment package for you, and then uploads it to create your Lambda function.

### Uploading a Deployment Package

AWS Lambda provides the [CreateFunction](https://docs.aws.amazon.com/lambda/latest/dg/API_CreateFunction.html) operation, which is what you use to create a Lambda function. You can use the AWS Lambda console, AWS CLI, and AWS SDKs to create a Lambda function. Internally, all of these interfaces call the CreateFunction operation.

In addition to providing your deployment package, you can provide configuration information when you create your Lambda function including the compute requirements of your Lambda function, the name of the handler method in your Lambda function, and the runtime, which depends on the language you chose to author your code. For more information, see [Working with Lambda Functions](https://docs.aws.amazon.com/lambda/latest/dg/lambda-introduction-function.html).

### Testing a Lambda Function

If your Lambda function is designed to process events of a specific type, you can use sample event data to test your Lambda function using one of the following methods:

* Test your Lambda function in the console.
* Test your Lambda function using the AWS CLI. You can use the Invoke method to invoke your Lambda function and pass in sample event data.
* Test your Lambda function locally using the [AWS SAM CLI](https://docs.aws.amazon.com/serverless-application-model/latest/developerguide/serverless-test-and-debug.html).

## Monitoring and Troubleshooting

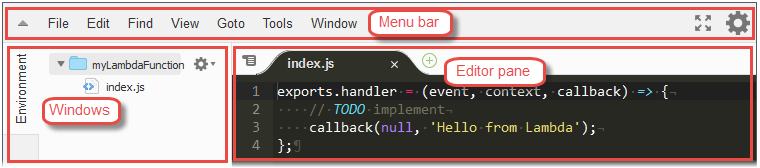
After your Lambda function is in production, AWS Lambda automatically monitors functions on your behalf, reporting metrics through Amazon CloudWatch. For more information, see [Monitoring Functions in the AWS Lambda Console](https://docs.aws.amazon.com/lambda/latest/dg/monitoring-functions-access-metrics.html).

To help you troubleshoot failures in a function, Lambda logs all requests handled by your function and also automatically stores logs that your code generates in Amazon CloudWatch Logs. For more information, see [Accessing Amazon CloudWatch Logs for AWS Lambda](https://docs.aws.amazon.com/lambda/latest/dg/monitoring-functions-logs.html).

# Creating Functions Using the AWS Lambda Console Editor

The code editor in the AWS Lambda console enables you to write, test, and view the execution results of your Lambda function code.

The code editor includes the menu bar, windows, and the editor pane.



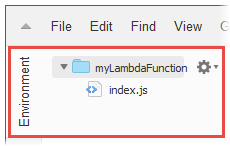
You use the menu bar to run common commands. For more information, see [Using the Menu Bar](https://docs.aws.amazon.com/lambda/latest/dg/code-editor.html#code-editor-menu-bar).

You use windows to work with files, folders, and other commands. For more information, see [Working with Files and Folders](https://docs.aws.amazon.com/lambda/latest/dg/code-editor.html#code-editor-files) and [Working with Commands](https://docs.aws.amazon.com/lambda/latest/dg/code-editor.html#code-editor-commands-overview).

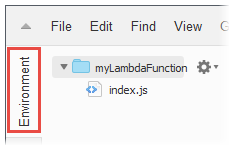
You use the editor pane to write code. For more information, see [Working with Code](https://docs.aws.amazon.com/lambda/latest/dg/code-editor.html#code-editor-code).

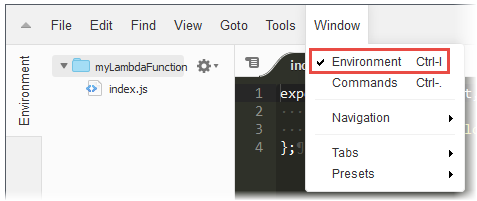
## Working with Files and Folders

You can use the **Environment** window in the code editor to create, open, and manage files for your function.



**To show or hide the Environment window**, choose the **Environment** button. If the **Environment** button is not visible, choose **Window, Environment** on the menu bar.



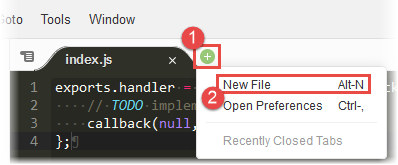


**To open a single file and show its contents in the editor pane**, double-click the file in the **Environment** window.

**To open multiple files and show their contents in the editor pane**, choose the files in the **Environment** window. Right-click the selection, and then choose **Open**.

**To create a new file**, do one of the following:

* In the **Environment** window, right-click the folder where you want the new file to go, and then choose **New File**. Type the file's name and extension, and then press **Enter** .
* Choose **File, New File** on the menu bar. When you're ready to save the file, choose **File, Save** or **File, Save As** on the menu bar. Then use the **Save As** dialog box that displays to name the file and choose where to save it.
* In the tab buttons bar in the editor pane, choose the **+** button, and then choose **New File**. When you're ready to save the file, choose **File, Save** or **File, Save As** on the menu bar. Then use the **Save As** dialog box that displays to name the file and choose where to save it.



**To create a new folder**, right-click the folder in the **Environment** window where you want the new folder to go, and then choose **New Folder**. Type the folder's name, and then press **Enter** .

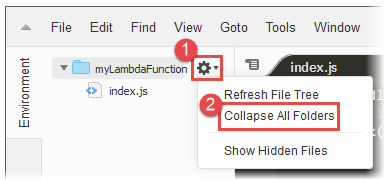
**To save a file**, with the file open and its contents visible in the editor pane, choose **File, Save** on the menu bar.

**To rename a file or folder**, right-click the file or folder in the **Environment** window. Type the replacement name, and then press **Enter** .

**To delete files or folders**, choose the files or folders in the **Environment** window. Right-click the selection, and then choose **Delete**. Then confirm the deletion by choosing **Yes** (for a single selection) or **Yes to All**.

**To cut, copy, paste, or duplicate files or folders**, choose the files or folders in the **Environment** window. Right-click the selection, and then choose **Cut**, **Copy**, **Paste**, or **Duplicate**, respectively.

**To collapse folders**, choose the gear icon in the **Environment** window, and then choose **Collapse All Folders**.

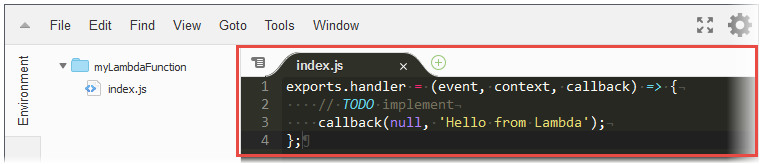


**To show or hide hidden files**, choose the gear icon in the **Environment** window, and then choose **Show Hidden Files**.

You can also create, open, and manage files by using the **Commands** window. For more information, see [Working with Commands](https://docs.aws.amazon.com/lambda/latest/dg/code-editor.html#code-editor-commands-overview).

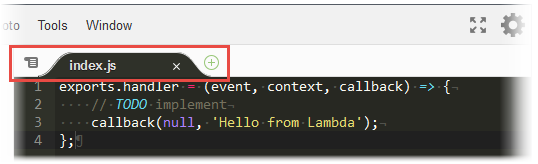
## Working with Code

Use the editor pane in the code editor to view and write code.



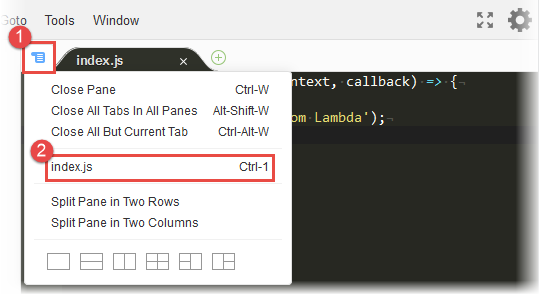
### Working with Tab Buttons

Use the tab buttons bar to select, view, and create files.



**To display an open file's contents**, do one of the following:

* Choose the file's tab.
* Choose the drop-down menu button in the tab buttons bar, and then choose the file's name.



**To close an open file**, do one of the following:

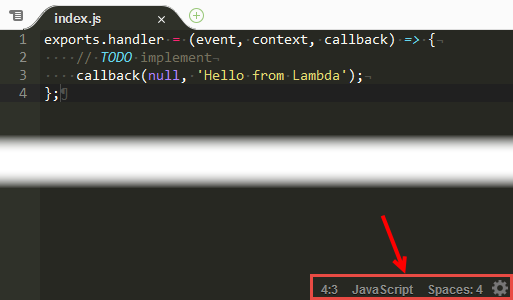
* Choose the **X** icon in the file's tab.
* Choose the file's tab. Then choose the drop-down menu button in the tab buttons bar, and choose **Close Pane**.

**To close multiple open files**, choose the drop-down menu in the tab buttons bar, and then choose **Close All Tabs in All Panes** or **Close All But Current Tab** as needed.

**To create a new file**, choose the **+** button in the tab buttons bar, and then choose **New File**. When you're ready to save the file, choose **File, Save** or **File, Save As** on the menu bar. Then use the **Save As** dialog box that displays to name the file and choose where to save it.

### Working with the Status Bar

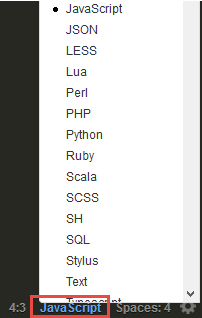
Use the status bar to move quickly to a line in the active file and to change how code is displayed.



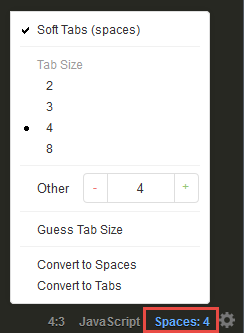
**To move quickly to a line in the active file**, choose the line selector, type the line number to go to, and then press**Enter** .

https://docs.aws.amazon.com/lambda/latest/dg/images/code-editor/code-editor-line-selector.png

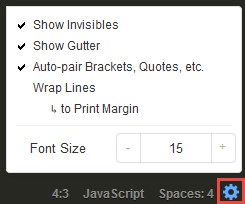
**To change the code color scheme in the active file**, choose the code color scheme selector, and then choose the new code color scheme.



**To change in the active file whether soft tabs or spaces are used, the tab size, or whether to convert to spaces or tabs**, choose the spaces and tabs selector, and then choose the new settings.



**To change for all files whether to show or hide invisible characters or the gutter, auto-pair brackets or quotes, wrap lines, or the font size**, choose the gear icon, and then choose the new settings.



## Using the Menu Bar

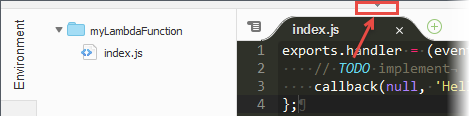
You can use the menu bar to run common commands.

https://docs.aws.amazon.com/lambda/latest/dg/images/code-editor/code-editor-menu-bar.png

**To hide the menu bar**, choose the up arrow in the menu bar.

https://docs.aws.amazon.com/lambda/latest/dg/images/code-editor/code-editor-menu-bar-hide.png

**To show the menu bar if it is hidden**, choose the down arrow in the menu bar.



For a list of what the commands do, see the [Menu Commands Reference](https://docs.aws.amazon.com/cloud9/latest/user-guide/menu-commands.html) in the AWS Cloud9 User Guide. Note that some of the commands listed in that reference are not available in the code editor.

You can also run commands by using the **Commands** window. For more information, see [Working with Commands](https://docs.aws.amazon.com/lambda/latest/dg/code-editor.html#code-editor-commands-overview).

## Working in Fullscreen Mode

You can expand the code editor to get more room to work with your code.

To expand the code editor to the edges of the web browser window, choose the **Toggle fullscreen** button in the menu bar.

https://docs.aws.amazon.com/lambda/latest/dg/images/code-editor/code-editor-menu-bar-fullscreen.png

To shrink the code editor to its original size, choose the **Toggle fullscreen** button again.

In fullscreen mode, additional options are displayed on the menu bar: **Save** and **Test**. Choosing **Save** saves the function code. Choosing **Test** or **Configure Events** enables you to create or edit the function's test events.

## Working with Preferences

You can change various code editor settings such as which coding hints and warnings are displayed, code folding behaviors, code autocompletion behaviors, and much more.

To change code editor settings, choose the **Preferences** gear icon in the menu bar.

https://docs.aws.amazon.com/lambda/latest/dg/images/code-editor/code-editor-menu-bar-preferences.png

For a list of what the settings do, see the following references in the AWS Cloud9 User Guide.

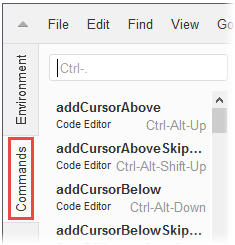
* [Project Setting Changes You Can Make](https://docs.aws.amazon.com/cloud9/latest/user-guide/settings-project.html#settings-project-change)
* [User Setting Changes You Can Make](https://docs.aws.amazon.com/cloud9/latest/user-guide/settings-user.html#settings-user-change)

Note that some of the settings listed in those references are not available in the code editor.

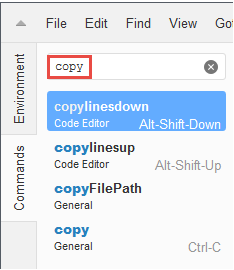
## Working with Commands

You can use the **Commands** window to run various commands such as those found on the menu bar, in the **Environment** window, in the editor pane.

**To show or hide the Commands window**, choose the **Commands** button. If the **Commands** button is not visible, choose **Window, Commands** on the menu bar.



To run a command, choose it in the **Commands** window. To find a command, type some or all of the command's name in the search box.



For a list of what the commands do, see the [Commands Reference](https://docs.aws.amazon.com/cloud9/latest/user-guide/commands.html) in the AWS Cloud9 User Guide. Note that some of the commands listed in that reference are not available in the code editor.

# Programming Model

You write code for your Lambda function in one of the languages AWS Lambda supports. Regardless of the language you choose, there is a common pattern to writing code for a Lambda function that includes the following core concepts:

* **Handler** – Handler is the function AWS Lambda calls to start execution of your Lambda function. You identify the handler when you create your Lambda function. When a Lambda function is invoked, AWS Lambda starts executing your code by calling the handler function. AWS Lambda passes any event data to this handler as the first parameter. Your handler should process the incoming event data and may invoke any other functions/methods in your code.
* **Context** – AWS Lambda also passes a  context  object to the handler function, as the second parameter. Via this context object your code can interact with AWS Lambda. For example, your code can find the execution time remaining before AWS Lambda terminates your Lambda function.

In addition, for languages such as Node.js, there is an asynchronous platform that uses callbacks. AWS Lambda provides additional methods on this context object. You use these context object methods to tell AWS Lambda to terminate your Lambda function and optionally return values to the caller.

* **Logging** – Your Lambda function can contain logging statements. AWS Lambda writes these logs to CloudWatch Logs. Specific language statements generate log entries, depending on the language you use to author your Lambda function code.

Logging is subject to [CloudWatch Logs limits](https://docs.aws.amazon.com/AmazonCloudWatch/latest/logs/cloudwatch_limits_cwl.html). Log data can be lost due to throttling or, in some cases, when the [execution context](https://docs.aws.amazon.com/lambda/latest/dg/running-lambda-code.html) is terminated.

* **Exceptions** – Your Lambda function needs to communicate the result of the function execution to AWS Lambda. Depending on the language you author your Lambda function code, there are different ways to end a request successfully or to notify AWS Lambda an error occurred during execution. If you invoke the function synchronously, then AWS Lambda forwards the result back to the client.
* **Concurrency** – When your function is invoked more quickly than a single instance of your function can process events, Lambda scales by running additional instances. Each instance of your function handles only one request at a time, so you don't need to worry about synchronizing threads or processes. You can, however, use asynchronous language features to process batches of events in parallel, and save data to the /tmp directory for use in future invocations on the same instance.

Your Lambda function code must be written in a stateless style, and have no affinity with the underlying compute infrastructure. Your code should expect local file system access, child processes, and similar artifacts to be limited to the lifetime of the request. Persistent state should be stored in Amazon S3, Amazon DynamoDB, or another cloud storage service. Requiring functions to be stateless enables AWS Lambda to launch as many copies of a function as needed to scale to the incoming rate of events and requests. These functions may not always run on the same compute instance from request to request, and a given instance of your Lambda function may be used more than once by AWS Lambda.

# Creating a .jar Deployment Package Using Maven without any IDE (Java)

This section shows how to package your Java code into a deployment package using Maven at the command line.

**Topics**

* [Before You Begin](https://docs.aws.amazon.com/lambda/latest/dg/java-create-jar-pkg-maven-no-ide.html#java-create-jar-pkg-maven-no-ide-pre-req)
* [Project Structure Overview](https://docs.aws.amazon.com/lambda/latest/dg/java-create-jar-pkg-maven-no-ide.html#java-create-jar-pkg-maven-no-ide-overview)
* [Step 1: Create Project](https://docs.aws.amazon.com/lambda/latest/dg/java-create-jar-pkg-maven-no-ide.html#java-create-jar-pkg-maven-no-ide-create-project)
* [Step 2: Build Project (Create Deployment Package)](https://docs.aws.amazon.com/lambda/latest/dg/java-create-jar-pkg-maven-no-ide.html#java-create-jar-pkg-maven-no-ide-build-project)

## Before You Begin

You will need to install the Maven command-line build tool. For more information, go to [Maven](https://maven.apache.org/). If you are using Linux, check your package manager.

sudo apt-get install mvn

if you are using Homebrew

brew install maven

## Project Structure Overview

After you set up the project, you should have the following folder structure:

*project-dir*/pom.xml

*project-dir*/src/main/java/ *(your code goes here)*

Your code will then be in the /java folder. For example, if your package name is example and you have a Hello.javaclass in it, the structure will be:

*project-dir*/src/main/java/example/Hello.java

After you build the project, the resulting .jar file (that is, your deployment package), will be in the *project-dir*/target subdirectory.

## Step 1: Create Project

Follow the steps in this section to create a Java project.

1. Create a project directory (*project-dir*).
2. In the *project-dir* directory, create the following:
   * Project Object Model file, pom.xml. Add the following project information and configuration details for Maven to build the project.
   * <project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   * xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/maven-v4\_0\_0.xsd">
   * <modelVersion>4.0.0</modelVersion>
   * <groupId>doc-examples</groupId>
   * <artifactId>lambda-java-example</artifactId>
   * <packaging>jar</packaging>
   * <version>1.0-SNAPSHOT</version>
   * <name>lambda-java-example</name>
   * <dependencies>
   * <dependency>
   * <groupId>com.amazonaws</groupId>
   * <artifactId>aws-lambda-java-core</artifactId>
   * <version>1.1.0</version>
   * </dependency>
   * </dependencies>
   * <build>
   * <plugins>
   * <plugin>
   * <groupId>org.apache.maven.plugins</groupId>
   * <artifactId>maven-shade-plugin</artifactId>
   * <version>2.3</version>
   * <configuration>
   * <createDependencyReducedPom>false</createDependencyReducedPom>
   * </configuration>
   * <executions>
   * <execution>
   * <phase>package</phase>
   * <goals>
   * <goal>shade</goal>
   * </goals>
   * </execution>
   * </executions>
   * </plugin>
   * </plugins>
   * </build>

</project>

**Note**

* + - In the dependencies section, the groupId (that is, com.amazonaws) is the Amazon AWS group ID for Maven artifacts in the Maven Central Repository. The artifactId (that is, aws-lambda-java-core) is the AWS Lambda core library that provides definitions of the RequestHandler, RequestStreamHandler, and the Context AWS Lambda interfaces for use in your Java application. At the build time Maven resolves these dependencies.
    - In the plugins section, the Apache maven-shade-plugin is a plugin that Maven will download and use during your build process. This plugin is used for packaging jars to create a standalone .jar (a .zip file), your deployment package.
    - If you are following other tutorial topics in this guide, the specific tutorials might require you to add more dependencies. Make sure to add those dependencies as required.

1. In the *project-dir*, create the following structure:

*project-dir*/src/main/java

1. Under the /java subdirectory you add your Java files and folder structure, if any. For example, if you Java package name is example, and source code is Hello.java, your directory structure looks like this:

*project-dir*/src/main/java/example/Hello.java

## Step 2: Build Project (Create Deployment Package)

Now you can build the project using Maven at the command line.

1. At a command prompt, change directory to the project directory (*project-dir*).
2. Run the following mvn command to build the project:

$ mvn package

The resulting .jar is saved as *project-dir*/target/lambda-java-example-1.0-SNAPSHOT.jar. The .jar name is created by concatenating the artifactId and version in the pom.xml file.

The build creates this resulting .jar, using information in the pom.xml to do the necessary transforms. This is a standalone .jar (.zip file) that includes all the dependencies. This is your deployment package that you can upload to AWS Lambda to create a Lambda function.

# Creating a .jar Deployment Package Using Maven and Eclipse IDE (Java)

This section shows how to package your Java code into a deployment package using Eclipse IDE and Maven plugin for Eclipse.

**Topics**

* [Before You Begin](https://docs.aws.amazon.com/lambda/latest/dg/java-create-jar-pkg-maven-and-eclipse.html#java-create-jar-pkg-maven-and-eclipse-before-you-begin)
* [Step 1: Create and Build a Project](https://docs.aws.amazon.com/lambda/latest/dg/java-create-jar-pkg-maven-and-eclipse.html#java-create-jar-pkg-maven-and-eclipse-create-project)

## Before You Begin

Install the **Maven** Plugin for Eclipse.

1. Start Eclipse. From the **Help** menu in Eclipse, choose **Install New Software**.
2. In the **Install** window, type **http://download.eclipse.org/technology/m2e/releases** in the **Work with:**box, and choose **Add**.
3. Follow the steps to complete the setup.

## Step 1: Create and Build a Project

In this step, you start Eclipse and create a Maven project. You will add the necessary dependencies, and build the project. The build will produce a .jar, which is your deployment package.

1. Create a new Maven project in Eclipse.
   1. From the **File** menu, choose **New**, and then choose **Project**.
   2. In the **New Project** window, choose **Maven Project**.
   3. In the **New Maven Project** window, choose **Create a simple project**, and leave other default selections.
   4. In the **New Maven Project**, **Configure project** windows, type the following **Artifact** information:
      * **Group Id**: doc-examples
      * **Artifact Id**: lambda-java-example
      * **Version**: 0.0.1-SNAPSHOT
      * **Packaging**: jar
      * **Name**: lambda-java-example
2. Add the aws-lambda-java-core dependency to the pom.xml file.

It provides definitions of the RequestHandler, RequestStreamHandler, and Context interfaces. This allows you to compile code that you can use with AWS Lambda.

* 1. Open the context (right-click) menu for the pom.xml file, choose **Maven**, and then choose **Add Dependency**.
  2. In the **Add Dependency** windows, type the following values:

**Group Id:** com.amazonaws

**Artifact Id:** aws-lambda-java-core

**Version:** 1.1.0

**Note**

If you are following other tutorial topics in this guide, the specific tutorials might require you to add more dependencies. Make sure to add those dependencies as required.

1. Add Java class to the project.
   1. Open the context (right-click) menu for the src/main/java subdirectory in the project, choose **New**, and then choose **Class**.
   2. In the **New Java Class** window, type the following values:
      * **Package**: **example**
      * **Name**: **Hello**

**Note**

If you are following other tutorial topics in this guide, the specific tutorials might recommend different package name or class name.

* 1. Add your Java code. If you are following other tutorial topics in this guide, add the provided code.

1. Build the project.

Open the context (right-click) menu for the project in **Package Explorer**, choose **Run As**, and then choose **Maven Build ...**. In the **Edit Configuration** window, type **package** in the **Goals** box.

**Note**

The resulting .jar, lambda-java-example-0.0.1-SNAPSHOT.jar, is not the final standalone .jar that you can use as your deployment package. In the next step, you add the Apache maven-shade-plugin to create the standalone .jar. For more information, go to [Apache Maven Shade Plugin](https://maven.apache.org/plugins/maven-shade-plugin/).

1. Add the maven-shade-plugin plugin and rebuild.

The maven-shade-plugin will take artifacts (jars) produced by the package goal (produces customer code .jar), and created a standalone .jar that contains the compiled customer code, and the resolved dependencies from the pom.xml.

* 1. Open the context (right-click) menu for the pom.xml file, choose **Maven**, and then choose **Add Plugin**.
  2. In the **Add Plugin** window, type the following values:
     + **Group Id:** org.apache.maven.plugins
     + **Artifact Id:** maven-shade-plugin
     + **Version:** 2.3
  3. Now build again.

This time we will create the jar as before, and then use the maven-shade-plugin to pull in dependencies to make the standalone .jar.

* + - Open the context (right-click) menu for the project, choose **Run As**, and then choose **Maven build ...**.
    - In the **Edit Configuration** windows, type **package shade:shade** in the **Goals** box.
    - Choose Run.

You can find the resulting standalone .jar (that is, your deployment package), in the /target subdirectory.

Open the context (right-click) menu for the /target subdirectory, choose **Show In**, choose **System Explorer**, and you will find the lambda-java-example-0.0.1-SNAPSHOT.jar.

# Handler Input/Output Types (Java)

When AWS Lambda executes the Lambda function, it invokes the handler. The first parameter is the input to the handler which can be event data (published by an event source) or custom input you provide such as a string or any custom data object.

AWS Lambda supports the following input/output types for a handler:

* Simple Java types (AWS Lambda supports the String, Integer, Boolean, Map, and List types)
* POJO (Plain Old Java Object) type
* Stream type (If you do not want to use POJOs or if Lambda's serialization approach does not meet your needs, you can use the byte stream implementation. For more information, see [Example: Using Stream for Handler Input/Output (Java)](https://docs.aws.amazon.com/lambda/latest/dg/java-handler-io-type-stream.html).)

## Handler Input/Output: String Type

The following Java class shows a handler called myHandler that uses String type for input and output.

package example;

import com.amazonaws.services.lambda.runtime.Context;

public class Hello {

public String myHandler(String name, Context context) {

return String.format("Hello %s.", name);

}

}

You can have similar handler functions for other simple Java types.

**Note**

When you invoke a Lambda function asynchronously, any return value by your Lambda function will be ignored. Therefore you might want to set the return type to void to make this clear in your code. For more information, see [Invoke](https://docs.aws.amazon.com/lambda/latest/dg/API_Invoke.html).

To test an end-to-end example, see [Create a Lambda Function Authored in Java](https://docs.aws.amazon.com/lambda/latest/dg/get-started-step4-optional.html).

## Handler Input/Output: POJO Type

The following Java class shows a handler called myHandler that uses POJOs for input and output.

package example;

import com.amazonaws.services.lambda.runtime.Context;

public class HelloPojo {

// Define two classes/POJOs for use with Lambda function.

public static class RequestClass {

...

}

public static class ResponseClass {

...

}

public static ResponseClass myHandler(RequestClass request, Context context) {

String greetingString = String.format("Hello %s, %s.", request.getFirstName(), request.getLastName());

return new ResponseClass(greetingString);

}

}

AWS Lambda serializes based on standard bean naming conventions (see [The Java EE 6 Tutorial](https://docs.oracle.com/javaee/6/tutorial/doc/gipks.html)). You should use mutable POJOs with public getters and setters.

**Note**

You shouldn't rely on any other features of serialization frameworks such as annotations. If you need to customize the serialization behavior, you can use the raw byte stream to use your own serialization.

# Example: Using POJOs for Handler Input/Output (Java)

Suppose your application events generate data that includes first name and last name as shown:

{ "firstName": "John", "lastName": "Doe" }

For this example, the handler receives this JSON and returns the string "Hello John Doe".

public static ResponseClass handleRequest(RequestClass request, Context context){

String greetingString = String.format("Hello %s, %s.", request.firstName, request.lastName);

return new ResponseClass(greetingString);

}

To create a Lambda function with this handler, you must provide implementation of the input and output types as shown in the following Java example. The HelloPojo class defines the handler method.

package example;

import com.amazonaws.services.lambda.runtime.Context;

import com.amazonaws.services.lambda.runtime.RequestHandler;

public class HelloPojo implements RequestHandler<RequestClass, ResponseClass>{

public ResponseClass handleRequest(RequestClass request, Context context){

String greetingString = String.format("Hello %s, %s.", request.firstName, request.lastName);

return new ResponseClass(greetingString);

}

}

In order to implement the input type, add the following code to a separate file and name it RequestClass.java. Place it next to the HelloPojo.java class in your directory structure:

package example;

public class RequestClass {

String firstName;

String lastName;

public String getFirstName() {

return firstName;

}

public void setFirstName(String firstName) {

this.firstName = firstName;

}

public String getLastName() {

return lastName;

}

public void setLastName(String lastName) {

this.lastName = lastName;

}

public RequestClass(String firstName, String lastName) {

this.firstName = firstName;

this.lastName = lastName;

}

public RequestClass() {

}

}

In order to implement the output type, add the following code to a separate file and name it ResponseClass.java. Place it next to the HelloPojo.java class in your directory structure:

package example;

public class ResponseClass {

String greetings;

public String getGreetings() {

return greetings;

}

public void setGreetings(String greetings) {

this.greetings = greetings;

}

public ResponseClass(String greetings) {

this.greetings = greetings;

}

public ResponseClass() {

}

}

**Note**

The get and set methods are required in order for the POJOs to work with AWS Lambda's built in JSON serializer. The constructors that take no arguments are usually not required, however in this example we provided other constructors and therefore we need to explicitly provide the zero argument constructors.

You can upload this code as your Lambda function and test as follows:

* Using the preceding code files, create a deployment package.
* Upload the deployment package to AWS Lambda and create your Lambda function. You can do this using the console or AWS CLI.
* Invoke the Lambda function manually using the console or the CLI. You can use provide sample JSON event data when you manually invoke your Lambda function. For example:

{ "firstName":"John", "lastName":"Doe" }

For more information, see [Create a Lambda Function Authored in Java](https://docs.aws.amazon.com/lambda/latest/dg/get-started-step4-optional.html). Note the following differences:

* When you create a deployment package, don't forget the aws-lambda-java-core library dependency.
* When you create the Lambda function, specify example.HelloPojo::handleRequest (*package*.*class*::*method*) as the handler value.

# Example: Using Stream for Handler Input/Output (Java)

If you do not want to use POJOs or if Lambda's serialization approach does not meet your needs, you can use the byte stream implementation. In this case, you can use the InputStream and OutputStream as the input and output types for the handler. An example handler function is shown:

public void handler(InputStream inputStream, OutputStream outputStream, Context context) throws IOException{

...

}

Note that in this case the handler function uses parameters for both the request and response streams.

The following is a Lambda function example that implements the handler that uses InputStream and OutputStreamtypes for the input and output parameters.

**Note**

The input payload must be valid JSON but the output stream does not carry such a restriction. Any bytes are supported.

package example;

import java.io.InputStream;

import java.io.OutputStream;

import com.amazonaws.services.lambda.runtime.RequestStreamHandler;

import com.amazonaws.services.lambda.runtime.Context;

public class Hello implements RequestStreamHandler{

public void handler(InputStream inputStream, OutputStream outputStream, Context context) throws IOException {

int letter;

while((letter = inputStream.read()) != -1)

{

outputStream.write(Character.toUpperCase(letter));

}

}

}

You can do the following to test the code:

* Using the preceding code, create a deployment package.
* Upload the deployment package to AWS Lambda and create your Lambda function. You can do this using the console or AWS CLI.
* You can manually invoke the code by providing sample input. For example:

test

Follow instructions provided in the Getting Started. For more information, see [Create a Lambda Function Authored in Java](https://docs.aws.amazon.com/lambda/latest/dg/get-started-step4-optional.html). Note the following differences:

* When you create a deployment package, don't forget the aws-lambda-java-core library dependency.
* When you create the Lambda function, specify example.Hello::handler (*package*.*class*::*method*) as the handler value.

# Leveraging Predefined Interfaces for Creating Handler (Java)

You can use one of the predefined interfaces provided by the AWS Lambda Java core library (aws-lambda-java-core) to create your Lambda function handler, as an alternative to writing your own handler method with an arbitrary name and parameters. For more information about handlers, see (see [AWS Lambda Function Handler in Java](https://docs.aws.amazon.com/lambda/latest/dg/java-programming-model-handler-types.html)).

You can implement one of the predefined interfaces, RequestStreamHandler or RequestHandler and provide implementation for the handleRequest method that the interfaces provide. You implement one of these interfaces depending on whether you want to use standard Java types or custom POJO types for your handler input/output (where AWS Lambda automatically serializes and deserializes the input and output to Match your data type), or customize the serialization using the Stream type.

**Note**

These interfaces are available in the aws-lambda-java-core library.

When you implement standard interfaces, they help you validate your method signature at compile time.

If you implement one of the interfaces, you specify *package*.*class* in your Java code as the handler when you create the Lambda function. For example, the following is the modified create-function CLI command from the getting started. Note that the --handler parameter specifies "example.Hello" value:

aws lambda create-function \

--region *region* \

--function-name getting-started-lambda-function-in-java \

--zip-file fileb://deployment-package (zip or jar)

path \

--role arn:aws:iam::account-id:role/lambda\_basic\_execution \

--handler example.Hello \

--runtime java8 \

--timeout 15 \

--memory-size 512

The following sections provide examples of implementing these interfaces.

## Example 1: Creating Handler with Custom POJO Input/Output (Leverage the RequestHandler Interface)

The example Hello class in this section implements the RequestHandler interface. The interface defines handleRequest() method that takes in event data as input parameter of the Request type and returns an POJO object of the Response type:

public Response handleRequest(Request request, Context context) {

...

}

The Hello class with sample implementation of the handleRequest() method is shown. For this example, we assume event data consists of first name and last name.

package example;

import com.amazonaws.services.lambda.runtime.RequestHandler;

import com.amazonaws.services.lambda.runtime.Context;

public class Hello implements RequestHandler<Request, Response> {

public Response handleRequest(Request request, Context context) {

String greetingString = String.format("Hello %s %s.", request.firstName, request.lastName);

return new Response(greetingString);

}

}

For example, if the event data in the Request object is:

{

"firstName":"value1",

"lastName" : "value2"

}

The method returns a Response object as follows:

{

"greetings": "Hello value1 value2."

}

Next, you need to implement the Request and Response classes. You can use the following implementation for testing:

The Request class:

package example;

public class Request {

String firstName;

String lastName;

public String getFirstName() {

return firstName;

}

public void setFirstName(String firstName) {

this.firstName = firstName;

}

public String getLastName() {

return lastName;

}

public void setLastName(String lastName) {

this.lastName = lastName;

}

public Request(String firstName, String lastName) {

this.firstName = firstName;

this.lastName = lastName;

}

public Request() {

}

}

The Response class:

package example;

public class Response {

String greetings;

public String getGreetings() {

return greetings;

}

public void setGreetings(String greetings) {

this.greetings = greetings;

}

public Response(String greetings) {

this.greetings = greetings;

}

public Response() {

}

}

You can create a Lambda function from this code and test the end-to-end experience as follows:

* Using the preceding code, create a deployment package. For more information, see [AWS Lambda Deployment Package in Java](https://docs.aws.amazon.com/lambda/latest/dg/lambda-java-how-to-create-deployment-package.html)
* Upload the deployment package to AWS Lambda and create your Lambda function.
* Test the Lambda function using either the console or CLI. You can specify any sample JSON data that conform to the getter and setter in your Request class, for example:
* {
* "firstName":"John",
* "lastName" : "Doe"

}

The Lambda function will return the following JSON in response.

{

"greetings": "Hello John, Doe."

}

Follow instructions provided in the getting started (see [Create a Lambda Function Authored in Java](https://docs.aws.amazon.com/lambda/latest/dg/get-started-step4-optional.html)). Note the following differences:

* When you create a deployment package, don't forget the aws-lambda-java-core library dependency.
* When you create the Lambda function specify example.Hello (*package*.*class*) as the handler value.

## Example 2: Creating Handler with Stream Input/Output (Leverage the RequestStreamHandlerInterface)

The Hello class in this example implements the RequestStreamHandler interface. The interface defines handleRequest method as follows:

public void handleRequest(InputStream inputStream, OutputStream outputStream, Context context)

throws IOException {

...

}

The Hello class with sample implementation of the handleRequest() handler is shown. The handler processes incoming event data (for example, a string "hello") by simply converting it to uppercase and return it.

package example;

import java.io.IOException;

import java.io.InputStream;

import java.io.OutputStream;

import com.amazonaws.services.lambda.runtime.RequestStreamHandler;

import com.amazonaws.services.lambda.runtime.Context;

public class Hello implements RequestStreamHandler {

public void handleRequest(InputStream inputStream, OutputStream outputStream, Context context)

throws IOException {

int letter;

while((letter = inputStream.read()) != -1)

{

outputStream.write(Character.toUpperCase(letter));

}

}

}

You can create a Lambda function from this code and test the end-to-end experience as follows:

* Use the preceding code to create deployment package.
* Upload the deployment package to AWS Lambda and create your Lambda function.
* Test the Lambda function using either the console or CLI. You can specify any sample string data, for example:

"test"

The Lambda function will return TEST in response.

Follow instructions provided in the getting started (see [Create a Lambda Function Authored in Java](https://docs.aws.amazon.com/lambda/latest/dg/get-started-step4-optional.html)). Note the following differences:

* When you create a deployment package, don't forget the aws-lambda-java-core library dependency.
* When you create the Lambda function specify example.Hello (*package*.*class*) as the handler value.

# AWS Lambda Context Object in Java

When Lambda runs your function, it passes a context object to the [handler](https://docs.aws.amazon.com/lambda/latest/dg/java-programming-model-handler-types.html). This object provides methods and properties that provide information about the invocation, function, and execution environment.

**Context Methods**

* getRemainingTimeInMillis() – Returns the number of milliseconds left before the execution times out.
* getFunctionName() – Returns the name of the Lambda function.
* getFunctionVersion() – Returns the [version](https://docs.aws.amazon.com/lambda/latest/dg/versioning-aliases.html) of the function.
* getInvokedFunctionArn() – Returns the Amazon Resource Name (ARN) used to invoke the function. Indicates if the invoker specified a version number or alias.
* getMemoryLimitInMB() – Returns the amount of memory configured on the function.
* getAwsRequestId() – Returns the identifier of the invocation request.
* getLogGroupName() – Returns the log group for the function.
* getLogStreamName() – Returns the log stream for the function instance.
* getIdentity() – (mobile apps) Returns information about the Amazon Cognito identity that authorized the request.
* getClientContext() – (mobile apps) Returns the client context provided to the Lambda invoker by the client application.
* getLogger() – Returns the [logger object](https://docs.aws.amazon.com/lambda/latest/dg/java-logging.html) for the function.

# AWS Lambda Function Logging in Java

Your Lambda function comes with a CloudWatch Logs log group, with a log stream for each instance of your function. The runtime sends details about each invocation to the log stream, and relays logs and other output from your function's code.

To output logs from your function code, you can use methods on [java.lang.System](https://docs.oracle.com/javase/8/docs/api/java/lang/System.html), or any logging module that writes to stdout or stderr. The following example uses System.out.println.

**Example Hello.java**

package example;

import com.amazonaws.services.lambda.runtime.Context;

import com.amazonaws.services.lambda.runtime.LambdaLogger;

public class Hello {

public String myHandler(String name, Context context) {

System.out.println("Event received.");

return String.format("Hello %s.", name);

}

}

The Lambda console shows log output when you test a function on the function configuration page. To view logs for all invocations, use the CloudWatch Logs console.

**To view your Lambda function's logs**

1. Open the [Logs page of the CloudWatch console](https://console.aws.amazon.com/cloudwatch/home?#logs:).
2. Choose the log group for your function (**/aws/lambda/*function-name***).
3. Choose the first stream in the list.

Each log stream corresponds to an [instance of your function](https://docs.aws.amazon.com/lambda/latest/dg/running-lambda-code.html). New streams appear when you update your function and when additional instances are created to handle multiple concurrent invocations. To find logs for specific invocations, you can instrument your function with X-Ray and record details about the request and log stream in the trace. For a sample application that correlates logs and traces with X-Ray, see [Error Processor Sample Application for AWS Lambda](https://docs.aws.amazon.com/lambda/latest/dg/sample-errorprocessor.html).

To get logs for an invocation from the command line, use the --log-type option. The response includes a LogResultfield that contains up to 4 KB of base64-encoded logs from the invocation.

$ **aws lambda invoke --function-name my-function out --log-type Tail**

{

"StatusCode": 200,

"LogResult": "U1RBUlQgUmVxdWVzdElkOiA4N2QwNDRiOC1mMTU0LTExZTgtOGNkYS0yOTc0YzVlNGZiMjEgVmVyc2lvb...",

"ExecutedVersion": "$LATEST"

}

You can use the base64 utility to decode the logs.

$ **aws lambda invoke --function-name my-function out --log-type Tail \**

**--query 'LogResult' --output text | base64 -d**

START RequestId: 8e827ab1-f155-11e8-b06d-018ab046158d Version: $LATEST

Processing event...

END RequestId: 8e827ab1-f155-11e8-b06d-018ab046158d

REPORT RequestId: 8e827ab1-f155-11e8-b06d-018ab046158d Duration: 29.40 ms Billed Duration: 100 ms Memory Size: 128 MB Max Memory Used: 19 MB

base64 is available on Linux, macOS, and [Ubuntu on Windows](https://docs.microsoft.com/en-us/windows/wsl/install-win10). For macOS, the command is base64 -D.

Log groups are not deleted automatically when you delete a function. To avoid storing logs indefinitely, delete the log group, or [configure a retention period](https://docs.aws.amazon.com/AmazonCloudWatch/latest/logs/Working-with-log-groups-and-streams.html#SettingLogRetention) after which logs are deleted automatically.

## LambdaLogger

Lambda provides a logger object that you can retrieve from the context object. LambdaLogger supports multi-line logs. If you log a string that includes line breaks with System.out.println, each line break results in a separate entry in CloudWatch Logs. If you use LambdaLogger, you get one entry with multiple lines.

The following example function logs context information.

**Example ContextLogger.java**

package example;

import java.io.InputStream;

import java.io.OutputStream;

import com.amazonaws.services.lambda.runtime.Context;

import com.amazonaws.services.lambda.runtime.LambdaLogger;

public class ContextLogger {

public static void myHandler(InputStream inputStream, OutputStream outputStream, Context context) {

LambdaLogger logger = context.getLogger();

int letter;

try {

while((letter = inputStream.read()) != -1)

{

outputStream.write(Character.toUpperCase(letter));

}

Thread.sleep(3000); // Intentional delay for testing the getRemainingTimeInMillis() result.

}

catch (Exception e)

{

e.printStackTrace();

}

logger.log("Log data from LambdaLogger \n with multiple lines");

// Print info from the context object

logger.log("Function name: " + context.getFunctionName());

logger.log("Max mem allocated: " + context.getMemoryLimitInMB());

logger.log("Time remaining in milliseconds: " + context.getRemainingTimeInMillis());

// Return the log stream name so you can look up the log later.

return String.format("Hello %s. log stream = %s", name, context.getLogStreamName());

}

}

**Dependencies**

* aws-lambda-java-core

Build the code with the Lambda library dependencies to create a deployment package. For instructions, see [AWS Lambda Deployment Package in Java](https://docs.aws.amazon.com/lambda/latest/dg/lambda-java-how-to-create-deployment-package.html).

## Custom Appender for Log4j 2

AWS Lambda recommends Log4j 2 to provide a custom appender. You can use the custom [Apache log4j](https://logging.apache.org/log4j/2.x/) appender provided by Lambda for logging from your functions. The custom appender is called LambdaAppender and must be used in the log4j2.xml file. You must include the aws-lambda-java-log4j2 artifact (artifactId:aws-lambda-java-log4j2) in the deployment package.

**Example Hello.java**

package example;

import com.amazonaws.services.lambda.runtime.Context;

import org.apache.logging.log4j.LogManager;

import org.apache.logging.log4j.Logger;

public class Hello {

// Initialize the Log4j logger.

static final Logger logger = LogManager.getLogger(Hello.class);

public String myHandler(String name, Context context) {

logger.error("log data from log4j err.");

// Return will include the log stream name so you can look

// up the log later.

return String.format("Hello %s. log stream = %s", name, context.getLogStreamName());

}

}

The example preceding uses the following log4j2.xml file to load properties

**Example log4j2.xml**

<?xml version="1.0" encoding="UTF-8"?>

<Configuration packages="com.amazonaws.services.lambda.runtime.log4j2">

<Appenders>

<Lambda name="Lambda">

<PatternLayout>

<pattern>%d{yyyy-MM-dd HH:mm:ss} %X{AWSRequestId} %-5p %c{1}:%L - %m%n</pattern>

</PatternLayout>

</Lambda>

</Appenders>

<Loggers>

<Root level="info">

<AppenderRef ref="Lambda" />

</Root>

</Loggers>

</Configuration>

**Dependencies**

* aws-lambda-java-log4j2
* log4j-core
* log4j-api

# AWS Lambda Function Errors in Java

If your Lambda function throws an exception, AWS Lambda recognizes the failure and serializes the exception information into JSON and returns it. Following is an example error message:

{

"errorMessage": "Name John Doe is invalid. Exception occurred...",

"errorType": "java.lang.Exception",

"stackTrace": [

"example.Hello.handler(Hello.java:9)",

"sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)",

"sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62)",

"sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)",

"java.lang.reflect.Method.invoke(Method.java:497)"

]

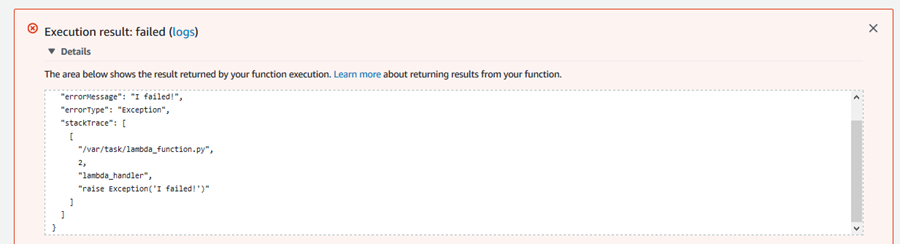
}

Note that the stack trace is returned as the stackTrace JSON array of stack trace elements.

The method in which you get the error information back depends on the invocation type that you specified at the time you invoked the function:

* RequestResponse invocation type (that is, synchronous execution): In this case, you get the error message back.

For example, if you invoke a Lambda function using the Lambda console, the RequestResponse is always the invocation type and the console displays the error information returned by AWS Lambda in the **Execution result**section as shown in the following image.



* Event invocation type (that is, asynchronous execution): In this case AWS Lambda does not return anything. Instead, it logs the error information in CloudWatch Logs and CloudWatch metrics.

Depending on the event source, AWS Lambda may retry the failed Lambda function. For example, if Kinesis is the event source for the Lambda function, AWS Lambda retries the failed function until the Lambda function succeeds or the records in the stream expire.

## Function Error Handling

You can create custom error handling to raise an exception directly from your Lambda function and handle it directly (Retry or Catch) within an AWS Step Functions State Machine. For more information, see [Handling Error Conditions Using a State Machine](https://docs.aws.amazon.com/step-functions/latest/dg/tutorial-handling-error-conditions.html).

Consider a CreateAccount [state](https://docs.aws.amazon.com/step-functions/latest/dg/awl-ref-states.html) is a [task](https://docs.aws.amazon.com/step-functions/latest/dg/awl-ref-states-task.html) that writes a customer's details to a database using a Lambda function.

* If the task succeeds, an account is created and a welcome email is sent.
* If a user tries to create an account for a username that already exists, the Lambda function raises an error, causing the state machine to suggest a different username and to retry the account-creation process.

The following code samples demonstrate how to do this. Note that custom errors in Java must extend the Exceptionclass.

package com.example;

public static class AccountAlreadyExistsException extends Exception {

public AccountAlreadyExistsException(String message) {

super(message);

}

}

package com.example;

import com.amazonaws.services.lambda.runtime.Context;

public class Handler {

public static void CreateAccount(String name, Context context) throws AccountAlreadyExistsException {

throw new AccountAlreadyExistsException ("Account is in use!");

}

}

You can configure Step Functions to catch the error using a Catch rule. Lambda automatically sets the error name to the fully-qualified class name of the exception at runtime:

{

"StartAt": "CreateAccount",

"States": {

"CreateAccount": {

"Type": "Task",

"Resource": "arn:aws:lambda:us-east-1:123456789012:function:CreateAccount",

"Next": "SendWelcomeEmail",

"Catch": [

{

"ErrorEquals": ["com.example.AccountAlreadyExistsException"],

"Next": "SuggestAccountName"

}

]

},

…

}

}

At runtime, AWS Step Functions catches the error, [transitioning](https://docs.aws.amazon.com/step-functions/latest/dg/concepts-transitions.html) to the SuggestAccountName state as specified in the Next transition.

Custom error handling makes it easier to create [serverless](https://aws.amazon.com/serverless) applications. This feature integrates with all the languages supported by the Lambda [Programming Model](https://docs.aws.amazon.com/lambda/latest/dg/programming-model-v2.html), allowing you to design your application in the programming languages of your choice, mixing and matching as you go.

# Instrumenting Java Code in AWS Lambda

In Java, you can have Lambda emit subsegments to X-Ray to show you information regarding downstream calls to other AWS services made by your function. To take advantage of this capability, include the [AWS X-Ray SDK for Java](https://docs.aws.amazon.com/xray/latest/devguide/xray-sdk-java.html)in your deployment package. No code changes are needed. As long as you are using an AWS SDK version 1.11.48 or later, there is no need to add any additional code lines for downstream calls from your function to be traced.

The AWS SDK will dynamically import the X-Ray SDK to emit subsegments for downstream calls made by your function. By using the X-Ray SDK for Java, you can instrument your code in order to emit custom subsegments and or add annotations to your X-Ray segments.

The following example uses the X-Ray SDK for Java to instrument a Lambda function to emit a custom subsegment and send custom annotation to X-Ray:

package uptime;

import java.io.IOException;

import java.time.Instant;

import java.util.HashMap;

import java.util.Map;

import org.apache.commons.logging.Log;

import org.apache.commons.logging.LogFactory;

import org.apache.http.HttpResponse;

import org.apache.http.client.HttpClient;

import org.apache.http.client.methods.HttpGet;

import com.amazonaws.regions.Regions;

import com.amazonaws.services.dynamodbv2.AmazonDynamoDB;

import com.amazonaws.services.dynamodbv2.AmazonDynamoDBClientBuilder;

import com.amazonaws.services.dynamodbv2.model.AttributeValue;

import com.amazonaws.services.lambda.runtime.Context;

import com.amazonaws.xray.AWSXRay;

import com.amazonaws.xray.proxies.apache.http.HttpClientBuilder;

public class Hello {

private static final Log logger = LogFactory.getLog(Hello.class);

private static final AmazonDynamoDB dynamoClient;

private static final HttpClient httpClient;

static {

dynamoClient = AmazonDynamoDBClientBuilder.standard().withRegion(Regions.US\_EAST\_1).build();

httpClient = HttpClientBuilder.create().build();

}

public void checkUptime(Context context) {

AWSXRay.createSubsegment("makeRequest", (subsegment) -> {

HttpGet request = new HttpGet("https://aws.amazon.com/");

boolean is2xx = false;

try {

HttpResponse response = httpClient.execute(request);

is2xx = (response.getStatusLine().getStatusCode() / 100) == 2;

subsegment.putAnnotation("responseCode", response.getStatusLine().getStatusCode());

} catch (IOException ioe) {

logger.error(ioe);

}

Map<String, AttributeValue> item = new HashMap<>();

item.put("Timestamp", new AttributeValue().withN("" + Instant.now().getEpochSecond()));

item.put("2xx", new AttributeValue().withBOOL(is2xx));

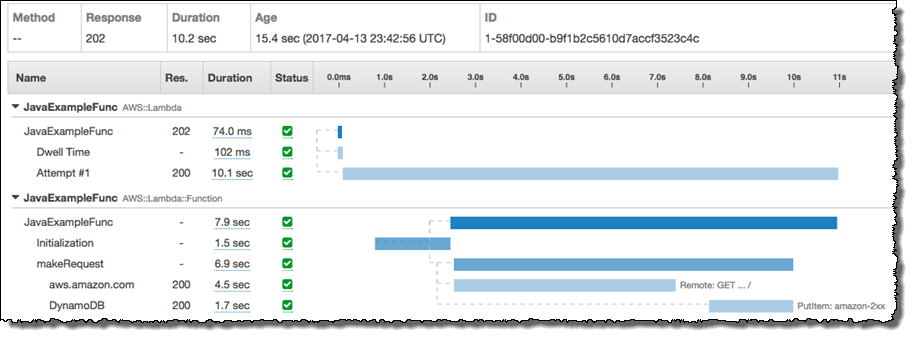
dynamoClient.putItem("amazon-2xx", item);

});

}

}

Following is what a trace emitted by the code preceding looks like (synchronous invocation):



# Create a Lambda Function Authored in Java

The blueprints provide sample code authored either in Python or Node.js. You can easily modify the example using the inline editor in the console. However, if you want to author code for your Lambda function in Java, there are no blueprints provided. Also, there is no inline editor for you to write Java code in the AWS Lambda console.

That means, you must write your Java code and also create your deployment package outside the console. After you create the deployment package, you can use the console to upload the package to AWS Lambda to create your Lambda function. You can also use the console to test the function by manually invoking it.

In this section you create a Lambda function using the following Java code example.

package example;

import com.amazonaws.services.lambda.runtime.Context;

import com.amazonaws.services.lambda.runtime.LambdaLogger;

public class Hello {

public String myHandler(int myCount, Context context) {

LambdaLogger logger = context.getLogger();

logger.log("received : " + myCount);

return String.valueOf(myCount);

}

}

The programming model explains how to write your Java code in detail, for example the input/output types AWS Lambda supports. For more information about the programming model, see [Building Lambda Functions with Java](https://docs.aws.amazon.com/lambda/latest/dg/java-programming-model.html). For now, note the following about this code:

* When you package and upload this code to create your Lambda function, you specify theexample.Hello::myHandler method reference as the handler.
* The handler in this example uses the int type for input and the String type for output.

AWS Lambda supports input/output of JSON-serializable types and InputStream/OutputStream types. When you invoke this function you will pass a sample int (for example, 123).

* You can use the Lambda console to manually invoke this Lambda function. The console always uses theRequestResponse invocation type (synchronous) and therefore you will see the response in the console.
* The handler includes the optional Context parameter. In the code we use the LambdaLogger provided by the Context object to write log entries to CloudWatch logs. For information about using the Context object, see [AWS Lambda Context Object in Java](https://docs.aws.amazon.com/lambda/latest/dg/java-context-object.html).

# Tutorial: Using AWS Lambda with Amazon Simple Queue Service

In this tutorial, you create a Lambda function to consume messages from an [Amazon SQS](https://docs.aws.amazon.com/AWSSimpleQueueService/latest/SQSDeveloperGuide/Welcome.html) queue.

## Prerequisites

This tutorial assumes that you have some knowledge of basic Lambda operations and the Lambda console. If you haven't already, follow the instructions in [Getting Started with AWS Lambda](https://docs.aws.amazon.com/lambda/latest/dg/getting-started.html) to create your first Lambda function.

To follow the procedures in this guide, you will need a command line terminal or shell to run commands. Commands are shown in listings preceded by a prompt symbol ($) and the name of the current directory, when appropriate:

~/lambda-project$ **this is a command**

this is output

For long commands, an escape character (\) is used to split a command over multiple lines.

On Linux and macOS, use your preferred shell and package manager. On Windows 10, you can [install the Windows Subsystem for Linux](https://docs.microsoft.com/en-us/windows/wsl/install-win10) to get a Windows-integrated version of Ubuntu and Bash.

## Create the Execution Role

Create the [execution role](https://docs.aws.amazon.com/lambda/latest/dg/lambda-intro-execution-role.html) that gives your function permission to access AWS resources.

**To create an execution role**

1. Open the [roles page](https://console.aws.amazon.com/iam/home#/roles) in the IAM console.
2. Choose **Create role**.
3. Create a role with the following properties.
   * **Trusted entity** – **AWS Lambda**.
   * **Permissions** – **AWSLambdaSQSQueueExecutionRole**.
   * **Role name** – **lambda-sqs-role**.

The **AWSLambdaSQSQueueExecutionRole** policy has the permissions that the function needs to read items from Amazon SQS and write logs to CloudWatch Logs.

## Create the Function

The following example code receives an Amazon SQS event input and processes the messages that it contains. For illustration, the code writes some of the incoming event data to CloudWatch Logs.

**Note**

For sample code in other languages, see [Sample Amazon SQS Function Code](https://docs.aws.amazon.com/lambda/latest/dg/with-sqs-create-package.html).

**Example index.js**

exports.handler = async function(event, context) {

event.Records.forEach(record => {

const { body } = record;

console.log(body);

});

return {};

}

**To create the function**

1. Copy the sample code into a file named index.js.
2. Create a deployment package.

$ **zip function.zip index.js**

1. Create a Lambda function with the create-function command.
2. $ **aws lambda create-function --function-name ProcessSQSRecord \**
3. **--zip-file fileb://function.zip --handler index.handler --runtime nodejs8.10 \**

**--role arn:aws:iam::*123456789012*:role/lambda-sqs-role**

## Test the Function

Invoke your Lambda function manually using the invoke AWS Lambda CLI command and a sample Amazon Simple Queue Service event.

If the handler returns normally without exceptions, Lambda considers the message processed successfully and begins reading new messages in the queue. Once a message is processed successfully, it is automatically deleted from the queue. If the handler throws an exception, Lambda considers the input of messages as not processed and invokes the function with the same batch of messages.

1. Copy the following JSON into a file and save it as input.txt.
2. {
3. "Records": [
4. {
5. "messageId": "059f36b4-87a3-44ab-83d2-661975830a7d",
6. "receiptHandle": "AQEBwJnKyrHigUMZj6rYigCgxlaS3SLy0a...",
7. "body": "test",
8. "attributes": {
9. "ApproximateReceiveCount": "1",
10. "SentTimestamp": "1545082649183",
11. "SenderId": "AIDAIENQZJOLO23YVJ4VO",
12. "ApproximateFirstReceiveTimestamp": "1545082649185"
13. },
14. "messageAttributes": {},
15. "md5OfBody": "098f6bcd4621d373cade4e832627b4f6",
16. "eventSource": "aws:sqs",
17. "eventSourceARN": "arn:aws:sqs:us-east-2:123456789012:my-queue",
18. "awsRegion": "us-east-2"
19. }
20. ]

}

1. Execute the following invoke command.
2. $ **aws lambda invoke --invocation-type RequestResponse --function-name ProcessSQSRecord \**

**--payload file://input.txt outputfile.txt**

The invoke command specifies RequestResponse as the invocation type, which requests synchronous execution. For more information, see [Invocation Types](https://docs.aws.amazon.com/lambda/latest/dg/invocation-options.html).

1. Verify the output in the outputfile.txt file.

## Create an Amazon SQS Queue

Create an Amazon SQS queue that the Lambda function can use as an event source.

**To create a queue**

1. Sign in to the AWS Management Console and open the Amazon SQS console at<https://console.aws.amazon.com/sqs/>.
2. In the Amazon SQS console, create a queue.
3. Write down or otherwise record the identifying queue ARN (Amazon Resource Name). You need this in the next step when you associate the queue with your Lambda function.

Create an event source mapping in AWS Lambda. This event source mapping associates the Amazon SQS queue with your Lambda function. After you create this event source mapping, AWS Lambda starts polling the queue.

Test the end-to-end experience. As you perform queue updates, Amazon Simple Queue Service writes messages to the queue. AWS Lambda polls the queue, detects new records and executes your Lambda function on your behalf by passing events, in this case Amazon SQS messages, to the function.

## Configure the Event Source

To create a mapping between the specified Amazon SQS queue and the Lambda function, run the following AWS CLIcreate-event-source-mapping command. After the command executes, write down or otherwise record the UUID. You'll need this UUID to refer to the event source mapping in any other commands, for example, if you choose to delete the event source mapping.

$ **aws lambda create-event-source-mapping --function-name ProcessSQSRecord --batch-size 10 \**

**--event-source *SQS-queue-arn***

You can get the list of event source mappings by running the following command.

$ **aws lambda list-event-source-mappings --function-name ProcessSQSRecord \**

**--event-source *SQS-queue-arn***

The list returns all of the event source mappings you created, and for each mapping it shows theLastProcessingResult, among other things. This field is used to provide an informative message if there are any problems. Values such as No records processed (indicates that AWS Lambda has not started polling or that there are no records in the queue) and OK (indicates AWS Lambda successfully read records from the queue and invoked your Lambda function) indicate that there no issues. If there are issues, you receive an error message.

## Test the Setup

Now you can test the setup as follows:

1. In the Amazon SQS console, send messsages to the queue. Amazon SQS writes records of these actions to the queue.
2. AWS Lambda polls the queue and when it detects updates, it invokes your Lambda function by passing in the event data it finds in the queue.
3. Your function executes and creates logs in Amazon CloudWatch. You can verify the logs reported in the Amazon CloudWatch console.

# Sample Amazon SQS Function Code

Sample code is available for the following languages.

**Topics**

* [Node.js](https://docs.aws.amazon.com/lambda/latest/dg/with-sqs-create-package.html#with-sqs-example-deployment-pkg-nodejs)
* [Java](https://docs.aws.amazon.com/lambda/latest/dg/with-sqs-create-package.html#with-sqs-example-deployment-pkg-java)
* [C#](https://docs.aws.amazon.com/lambda/latest/dg/with-sqs-create-package.html#with-sqs-example-deployment-pkg-dotnet)
* [Go](https://docs.aws.amazon.com/lambda/latest/dg/with-sqs-create-package.html#with-sqs-example-deployment-pkg-go)
* [Python](https://docs.aws.amazon.com/lambda/latest/dg/with-sqs-create-package.html#with-sqs-example-deployment-pkg-python)

## Node.js

The following is example code that receives an Amazon SQS event message as input and processes it. For illustration, the code writes some of the incoming event data to CloudWatch Logs.

**Example index.js (Node.js 8)**

exports.handler = async function(event, context) {

event.Records.forEach(record => {

const { body } = record;

console.log(body);

});

return {};

}

**Example index.js (Node.js 6)**

event.Records.forEach(function(record) {

var body = record.body;

console.log(body);

});

callback(null, "message");

};

Zip up the sample code to create a deployment package. For instructions, see [AWS Lambda Deployment Package in Node.js](https://docs.aws.amazon.com/lambda/latest/dg/nodejs-create-deployment-pkg.html).

## Java

The following is example Java code that receives an Amazon SQS event message as input and processes it. For illustration, the code writes some of the incoming event data to CloudWatch Logs.

In the code, handleRequest is the handler. The handler uses the predefined SQSEvent class that is defined in the aws-lambda-java-events library.

**Example ProcessSQSRecord.java**

import com.amazonaws.services.lambda.runtime.Context;

import com.amazonaws.services.lambda.runtime.RequestHandler;

import com.amazonaws.services.lambda.runtime.events.SQSEvent;

import com.amazonaws.services.lambda.runtime.events.SQSEvent.SQSMessage;

public class ProcessSQSEvents implements RequestHandler<SQSEvent, Void>{

@Override

public Void handleRequest(SQSEvent event, Context context)

{

for(SQSMessage msg : event.getRecords()){

System.out.println(new String(msg.getSQS().getBody()));

}

return null;

}

}

**Dependencies**

* aws-lambda-java-core
* aws-lambda-java-events

Build the code with the Lambda library dependencies to create a deployment package. For instructions, see [AWS Lambda Deployment Package in Java](https://docs.aws.amazon.com/lambda/latest/dg/lambda-java-how-to-create-deployment-package.html).

## C#

The following is example C# code that receives an Amazon SQS event message as input and processes it. For illustration, the code writes some of the incoming event data to the console.

In the code, handleRequest is the handler. The handler uses the predefined SQSEvent class that is defined in the AWS.Lambda.SQSEvents library.

**Example ProcessingSQSRecords.cs**

[assembly: LambdaSerializer(typeof(Amazon.Lambda.Serialization.Json.JsonSerializer))]

namespace SQSLambdaFunction

{

public class SQSLambdaFunction

{

public string HandleSQSEvent(SQSEvent sqsEvent, ILambdaContext context)

{

Console.WriteLine($"Beginning to process {sqsEvent.Records.Count} records...");

foreach (var record in sqsEvent.Records)

{

Console.WriteLine($"Message ID: {record.MessageId}");

Console.WriteLine($"Event Source: {record.EventSource}");

Console.WriteLine($"Record Body:");

Console.WriteLine(record.Body);

}

Console.WriteLine("Processing complete.");

return $"Processed {sqsEvent.Records.Count} records.";

}

}

}

Replace the Program.cs in a .NET Core project with the above sample. For instructions, see [.NET Core CLI](https://docs.aws.amazon.com/lambda/latest/dg/lambda-dotnet-coreclr-deployment-package.html).

## Go

The following is example Go code that receives an Amazon SQS event message as input and processes it. For illustration, the code writes some of the incoming event data to CloudWatch Logs.

In the code, handler is the handler. The handler uses the predefined SQSEvent class that is defined in the aws-lambda-go-events library.

**Example ProcessSQSRecords.go**

package main

import (

"context"

"fmt"

"github.com/aws/aws-lambda-go/events"

"github.com/aws/aws-lambda-go/lambda"

)

func handler(ctx context.Context, sqsEvent events.SQSEvent) error {

for \_, message := range sqsEvent.Records {

fmt.Printf("The message %s for event source %s = %s \n", message.MessageId, message.EventSource, message.Body)

}

return nil

}

func main() {

lambda.Start(handler)

}

Build the executable with go build and create a deployment package. For instructions, see [AWS Lambda Deployment Package in Go](https://docs.aws.amazon.com/lambda/latest/dg/lambda-go-how-to-create-deployment-package.html).

## Python

The following is example Python code that accepts an Amazon SQS record as input and processes it. For illustration, the code writes to some of the incoming event data to CloudWatch Logs.

Follow the instructions to create a AWS Lambda function deployment package.

**Example ProcessSQSRecords.py**

from \_\_future\_\_ import print\_function

def lambda\_handler(event, context):

for record in event['Records']:

print ("test")

payload=record["body"]

print(str(payload))

Zip up the sample code to create a deployment package. For instructions, see [AWS Lambda Deployment Package in Python](https://docs.aws.amazon.com/lambda/latest/dg/lambda-python-how-to-create-deployment-package.html).

# AWS SAM Template for an Amazon SQS Application

You can build this application using [AWS SAM](https://docs.aws.amazon.com/serverless-application-model/latest/developerguide/). To learn more about creating AWS SAM templates, see [AWS SAM Template Basics](https://docs.aws.amazon.com/serverless-application-model/latest/developerguide/serverless-sam-template-basics.html) in the AWS Serverless Application Model Developer Guide.

Below is a sample AWS SAM template for the Lambda application from the [tutorial](https://docs.aws.amazon.com/lambda/latest/dg/with-sqs-example.html). Copy the text below to a .yaml file and save it next to the ZIP package you created previously. Note that the Handler and Runtime parameter values should match the ones you used when you created the function in the previous section.

AWSTemplateFormatVersion: '2010-09-09'

Transform: AWS::Serverless-2016-10-31

Description: Example of processing messages on an SQS queue with Lambda

Resources:

MySQSQueueFunction:

Type: AWS::Serverless::Function

Properties:

Handler: *handler*

Runtime: *runtime*

Events:

MySQSEvent:

Type: SQS

Properties:

Queue: !GetAtt *MySqsQueue.Arn*

BatchSize: 10

MySqsQueue:

Type: AWS::SQS::Queue

For information on how to package and deploy your serverless application using the package and deploy commands, see [Deploying Serverless Applications](https://docs.aws.amazon.com/serverless-application-model/latest/developerguide/serverless-deploying.html) in the AWS Serverless Application Model Developer Guide.

## **Top AWS Solution Architect Questions and Answers**

**Q1). How will you compare two popular cloud service providers – AWS and Azure?**

To understand the difference between the two most popular cloud service providers i.e. AWS and Azure, let us refer to the table given below.

|  |  |  |
| --- | --- | --- |
| **Parameters** | **AWS** | **Azure** |
| **Initiation** | 2006 | 2010 |
| **Market Share** | 4X | X |
| **Implementation** | Less Options | More Experimentation Possible |
| **Features** | Widest Range of Options | Good Range of Options |
| **App Hosting** | AWS Not as Good as Azure | Azure is Better |
| **Development** | Varied & Great Features | Varied & Great Features |
| **IaaS Offerings** | Good Market Hold | Better Offering Than AWS |

 **Q2). I have a few private servers and I distributed some of the workloads on the public cloud too. Which type of architecture is this?**

When you use both services like private and public cloud together then it’s the hybrid cloud. it is easier to understand a hybrid architecture when private or public clouds are hosted on the same network virtually.

**Q3). There is a video transcoding application to process videos in a queue. If the processing of a video is interrupted in between then it is resumed by another instance. Currently, there is a huge backlog of videos that needs to be processed and we require more instances for the same. But we need these instances until the backlog is not clear. So, what would be the most efficient way to achieve the purpose?**

You should use on-demand instances for this purpose. You must be wondering why? Firstly, you need instances immediately to process the videos. Secondly, you don’t need them when the backlog is clear. Reserved instances are out of the picture here because instances are needed for a certain time span only. Spot instances are also not suitable because work is urgent and you cannot stop the work just because of the spot price spiked. Hence, on-demand instances are the right choice in this scenario.

**Q4). How are stopping and terminating an instance two different processes?**

* **Stopping an Instance**: When an instance is stopped, it performs a normal shutdown. However its Amazon EBS volume remains attached and you can start the same instance later when needed. The benefit of stopping an instance is that you are not charged anything for that particular instance, once it is stopped.
* **Terminating an Instance:** When an instance is terminated, it performs a normal shutdown and all Amazon EBS volumes attached to the instance are deleted at the same time. Once an instance is terminated, you cannot start it over again.

**Q5). If I want to run my instance on single-tenant hardware, which option I have to set for the instance tenancy attribute?**

* Dedicated
* Isolated
* One
* Reserved

The instance tenancy attribute should be set to the Dedicate instance here to run the instance on single-tenant hardware. Rest of the options are invalid.

**Q6). What are the costs associated with an Elastic IP address (EIP)?** You don’t have to pay anything when only one IP address is attached with your running instance. But you need to pay in the following conditions:

* When more than one EIPs are associated with your running instance.
* When EIP is attached to the stopped instance.
* When EIP is not attached to any instance.

**Q7). Can we use reserved instances for multi-AZ deployments in AWS?**

Reserved Instances are the pricing models available for all Amazon EC2 Instances.

**Q8). How is a Spot Instance different from the Reserved or On-demand Instance?**

Spot instances, Reserved instances, and On-demand instances all are pricing models. Spot instance gives the flexibility to the users to buy compute capacity with no upfront investment but at the same time you have to pay hourly that is lower than on-demand instance rate in each region.

Spot instances are similar to bidding, and the bidding price for these instances is called the Spot Price. The price may fluctuate based on the supply and demand curve for instances but you never pay more than maximum price as specified. When spot prices move higher than the maximum price, the EC2 instances shut down automatically in that case. But the reverse is not true, if spot prices come down, EC2 Instances are not launched automatically. It can be done manually.

For Spot and On-demand instances, there is no commitment from the user side. However, in case of Reserved Instances, one has to stick to the time period that was chosen earlier.

**Q9). What are the network performance parameters when you launch an instance in the cluster placement group?**

The network performance parameters depend on the instance type and network specifications. If an instance is launched in cluster placement group then you can expect the following performance parameters:

* For a single flow, 10 Gbps speed
* For multi-flow, 20 Gbps speed
* For the network traffic outside the placement group, speed is limited to 5Gbps.

**Q10). Which instance type can be used to deploy a 4-node Hadoop cluster in AWS?**

Each Hadoop cluster is based on the master-slave concept where master machine processes the data and slave machine stores the data like data nodes. Since all the processing is done at the master machine, a high capacity CPU and RAM is needed here and as all the storage is done at the slave machine, a high capacity hard disk is needed.

You are free to decide the configuration of the machine based on the workload. If you are not interested in configuring machine manually then you can straight away launch an Amazon EMR instance that configures the server automatically for you. You dump the data to be processed in S3, EMR picks the data from there, processes it, and dumps it back to the S3.

**Q11). When you are designing an architecture for a solution, where do you think AMI fits?**

AMIs (Amazon Machine Images) are like templates for the virtual machine or an instance derived from an AMI. Aws offers pre-ready AMIs that you can choose to launch an instance. A few of them are not free that you can buy from the AWS marketplace.

You are free to create your own custom AMI that helps you to save space on the AWS as it is more cost effective and suitable for your project.

**Q12). How to decide on the best availability zone?**

To choose the best availability zone, you should first compare the prices for different regions. But price is not the single factor to make the final decision; you also need to consider the performance. Let us look at the latency as well. It’s the time taken by a server to respond to your requests.  Based on these factors, it is easier to decide on the best availability zone from different regions.

**Q13). Is one Elastic IP address enough for every running instance?**

Each instance has its own private and public address. A private address is associated exclusively with an instance and it is returned when an instance is stopped or terminated. Similarly, a public address is also associated exclusively with an instance until it is stopped or terminated. However, one can assign an EIP (Elastic IP address) to an instance that stays longer till the time the user does not detach it manually. In case, you are hosting multiple websites on your EC2 server then you need multiple EIP addresses in that scenario.

**Q14). How to maintain the security for Amazon EC2 instances?**

There are multiple best practices to secure an Amazon EC2 instance. They are given as below.

* To control the access of AWS resources, you should use IAM (Identity and Access Management) protocol.
* To give access to trusted users or networks, you should restrict unwanted access by following certain security principles.
* To maintain secure access, review the rules of security groups regularly and only open up permissions that are required.
* To manage the security risks, disable the password-based logins for instance launched from an AMI.

**Q15). Can we use S3 bucket with EC2 Instances too?**

Yes, it can be used with the root devices backed by local instances storage. With Amazon S3, developers have access to reliable and expensive data storage infrastructure that used by Amazon to run its global websites.