A guide to

# AWS CERTIFICATION EXAMS

## What are AWS Certifications?

AWS Certifications are offered as a way to help quantify an IT professional's degree of proficiency managing AWS cloud services. Certification requires taking an exam to assess your level of expertise and skill in particular areas of AWS functionality. AWS partners and customers are asked to recertify every two years.

## Why become AWS Certified?

- Certification measures knowledge, skill and experience by a universally recognized yardstick.This formalizes qualifications, thereby enhancing your credibility with colleagues and both current and potential employers.
- The job market for cloud computing professionals is better than ever before. As of December 2014, there were 384,478 cloud related IT jobs in the US alone (from WANTED Analytics, via Forbes Magazine). For a more comprehensive review of the cloud computing job market, watch for a new e-book coming soon to Cloud Academy.
- Achieving certification significantly increases a candidate's marketability and appeal to recruiters. Since AWS is by far the market leader in cloud computing, in size, in sophistication of offerings and in market share, their in-house certifications can be particularly powerful.

- In addition, the process of achieving certification encourages candidates to expand their expertise by familiarizing themselves with parts of AWS they have not had the opportunity to encounter at work. This could be services they haven't used, or even techniques and tips for working with the services they use regularly.

- Upon passing the exam, candidates receive a certificate confirming their success and are also entitled to use the certification credential logo on business cards, websites and any other business materials.

## Types of AWS Certification

AWS offers 3 categories of certification: **Solutions Architect**, **SysOps Administrator** and **Developer**. Each of these is currently available on an Associate or Professional level. Right now, there are actually only five exams in total, since one exam covers both the Developer and SysOps Administrator on the Professional Level. (There are unconfirmed rumors of a future Master Level Certification.)

Exams are available in multiple languages such as English, Simplified Chinese, German, Japanese, French, Korean. At the time of writing, the Professional Level exam for the DevOps Engineer certification is only available in English.

| | *Solutions Architect* | *Developer* | *SysOps Administrator* |
|---|---|---|---|
| Associate Level | AWS Certified Solutions Architect-Associate<br>*Offered in English, Japanese, Simplified Chinese, Korean, French, and German* | AWS Certified Developer – Associate<br>*Offered in English, Simplified Chinese, and Japanese* | AWS Certified SysOps Administrator – Associate<br>*Offered in English, Simplified Chinese, and Japanese* |
| Professional Level | AWS Certified Solutions Architect-Professional<br>*Offered in English and Japanese* | AWS Certified DevOps Engineer – Professional<br>*Offered in English only* | AWS Certified DevOps Engineer – Professional<br>*Offered in English only* |

## AWS Certification Exams: Qualification and Content

- For all of certification types, the Associate level requires at least one year of professional experience in the appropriate field, and the Professional level requires two years. In addition, all the certifications require candidates to have in-depth knowledge of at least one high-level programming language.

- Associate-level certification exams have no prerequisite certifications or training, but the Professional-level exams require previous certification at the Associate level.

- The content of the tests at the Professional level generally includes the same concepts as the Associate level, but expecting increased depth and complications. The exams are written with multiple-choice and multiple-answer questions. Associate Level exams include 55 questions and are allotted 80 minutes; Professional Level exams are 170 minutes long.

## Certification Types

**The Solutions Architect**
It is intended for individuals with experience *designing distributed applications* and *systems* on the AWS platform. This exam assesses the candidate's expertise in planning of highly available, fault-tolerant systems; migration of existing architectures to AWS; estimating costs and identifying cost control mechanisms. In addition, applicants must show proficiency in selecting the appropriate AWS service based on data, compute, database, or security requirements, and identifying appropriate use of AWS architectural best practices.

**The Professional Level**
Candidates are expected to be able to implement cost control strategies; to provide best practices guidance for architectural design across multiple applications, projects, or the enterprise; and for migrating complex, multi-tier applications to AWS.

**Developer**
It is intended for individuals with technical expertise in *developing* and *maintaining applications* on the AWS platform. This exam includes topics like selecting appropriate AWS services, using the AWS SDKs to interact with AWS services, optimizing performance and code-level security. This path is focused on a smaller set of services than the previous one, but in more depth.

**The SysOps Administrator**
It is aimed at individuals with technical expertise in *deployment, management, and operations* on the AWS platform. Topics here are typically common to the AWS Solutions Architect path, but from an operational point of view.

**The DevOps Engineer – Professional Level** This certification is the Professional Level for both the Developer and the SysOps streams. As such, candidates are required to have either one of the two certifications at the Associate level. In addition, candidates need experience in automation and testing via scripting/programming, and an understanding of agile and other development processes and methodologies.

The exam is designed to measure technical expertise in *provisioning*, *operating*, and *managing* **distributed** application systems on the AWS platform. It identifies individuals who are capable of implementing and managing systems which are highly available, scalable, and self-healing on the AWS platform. Furthermore, it tests candidates' ability to create and work with tools to automate operational processes, as well as administer monitoring, metrics, and logging systems on AWS.

# How to Prepare for AWS Certification ?

AWS maintains that experience and on-the job skills are the most important part of preparing to take a certification exam.  In fact, Jamie Begin, a blogger at Right Brain Networks, after passing his AWS Certified Solutions Architect - Associate level certification, wrote:

*"…there weren't any "gotcha" or filler questions… The exam was obviously authored by someone who has real world experience working with AWS and not just combing through the online docs looking for factoids."*

There are, however, materials that can help you review the necessary information and brush up on critical concepts.

AWS provides an exam blueprint for each type of certification which includes

- The exam's objective
- a detailed description of the skills, experience and knowledge that candidates are expected to have going into the exam, both AWS- specific and general IT
- a partial list of AWS-provided documentation and available training courses which are helpful in preparing for the exam
- the exam marking scheme
- an explanation of the types of questions on the exam
- a breakdown of all the topics included in the exam's content

Links to the blueprint documents for each certification exam can be accessed from the individual certification pages linked from the main Amazon certification page.

In addition to the documentation mentioned in the exam blueprint, the AWS website recommends reading all the AWS FAQs and documentation.

The training options mentioned in the blueprint include actual in-class courses, online instructional videos, and hands on, self-paced labs offered at qwiklabs.com. There are also other, third party training providers (like ***CloudAcademy.com***) which provide videos, labs and other educational materials which are as good as, or better than those supplied by AWS. Pricing models vary.

AWS also provides a number of sample exam questions for each of the certification types to help candidates get a sense of type, depth and level of detail included in the exam. You can download these samples from each individual certification page linked from the ***main AWS certification page.*** They are also useful for self-assessment and finding areas requiring more intense study.

To gain even more insight into the exam style, it is a good idea to take a practice exam. These exams are available online and on-demand through the Kryterion website https://www.webassessor.com/aws . Registration involves the same procedure as you use for the Certification exam. In addition to providing familiarity with the exam structure and content, taking a practice exam will further help you assess your readiness for the real thing.

Associate practice exams require you to complete 20 questions within a 30 minute period and cost USD 20. The Professional practice exams have 40 questions, a time limit of a full hour, and cost USD 40.

First, make sure that you meet the criteria for the certification level you are attempting.

## Signing up for an Exam

- Next, register online to take the exam at Web Assessor. You will need to provide some contact information as well as professional information and create a Webassessor account.
- Log in to Webassessor, select the exam you would like to take and the location you would like to attend. The exams are administered at Kryterion testing centers in over 750 locations across the globe, including centers in 24 US States.

You must agree to the AWS Certification Program Agreement governing the Certification program. This includes agreeing that content, including questions, answers and/or diagrams of the Amazon Web Services certification exams are the proprietary and confidential property of AWS. They may not be copied or distributed in anyway without the express written authorization of AWS. Violation of this policy could result in revocation of any Certification earned.

Schedule a date and time for your exam. Different testing centers have different hours of operation, ranging from one day a week, to every weekday in 15 minute intervals from 9am-3:30pm. Some even have slots on selected Saturdays. You can explore different testing centers' operating hours to find an time that works for you.

The registration fee for an Associate Exam is USD 150 and a Professional Exam is USD 300. If you need to cancel or reschedule an exam, you can reschedule from within your Webassessor account with no fee, up to 72 hours prior to the exam appointment. Cancelling or rescheduling an exam less than 72 hours in advance is subject to a USD 75 rescheduling fee and requires contacting AWS directly. Candidates who miss their scheduled exam appointments without rescheduling, forfeit the exam fee.

After paying for the exam, you will be provided with a Test Taker Authorization Code which **must** be provided to the proctor at the exam.

## Attending the Exam

Besides your Test Taker Authorization Code, when you go to take your exam, you will be asked for two forms of personal identification bearing your signature. One of the two forms of ID must include your photo, such as a driver's license or passport.

At the testing center, no personal property is allowed in the test area. During the exam check-in process, you will be asked to turn out exterior pockets to verify that the pockets do not contain any prohibited items. Reference materials and electronic devices are not allowed and external eyewear is inspected to ensure that it is not technology-enabled. For a Professional Exam you may request a pencil and paper from the exam proctor; these materials must be returned to the exam proctor before exiting the exam center.

Immediately after completing your exam you will receive your exam results on-screen. AWS does not publish exam passing scores because exam questions and passing scores are subject to change without notice.

If you fail an exam, you can retake the exam up to three times within one year from the date of your first attempt. There has to be a 30 day interval in-between exam attempts, and the full exam fee must be paid each time.

## Conclusion

If you are working in the Cloud Computing space and using AWS, consider becoming AWS-certified. Given your experience and all the great web-based learning services available to help, it should not be a difficult or onerous process, and the potential rewards for having this impressive qualification are significant.

## Sample Questions

Below are some sample questions which provide a sense of the types of questions included in the AWS Certification Exam. There are a number of these offered on the AWS website for each of the certification tests.  It is clear from the examples below that the Professional Level questions are much more complicated, longer, and have a much higher level of detail than the Associate Level questions. To see more examples, follow the links provided.

### Solutions Architect–Associate Level

To protect S3 data from both accidental deletion and accidental overwriting, you should:

A. enable S3 versioning on the bucket
B. access S3 data using only signed URLs
C. disable S3 delete using an IAM bucket policy
D. enable S3 Reduced Redundancy Storage
E. enable Multi-Factor Authentication (MFA) protected access

## Solutions Architect–Professional Level

Your company hosts an on-premises legacy engineering application with 900GB of data shared via a central file server. The engineering data consists of thousands of individual files ranging in size from megabytes to multiple gigabytes. Engineers typically modify 5-10 percent of the files a day. Your CTO would like to migrate this application to AWS, but only if the application can be migrated over the weekend to minimize user downtime. You calculate that it will take a minimum of 48 hours to transfer 900GB of data using your company's existing 45-Mbps Internet connection. After replicating the application's environment in AWS, which option will allow you to move the application's data to AWS without losing any data and within the given timeframe?

A. Copy the data to Amazon S3 using multiple threads and multi-part upload for large files over the weekend, and work in parallel with your developers to reconfigure the replicated application environment to leverage Amazon S3 to serve the engineering files.

A. Sync the application data to Amazon S3 starting a week before the migration, on Friday morning perform a final sync, and copy the entire data set to your AWS file server after the sync completes.

B. Copy the application data to a 1-TB USB drive on Friday and immediately send overnight, with Saturday delivery, the USB drive to AWS Import/Export to be imported as an EBS volume, mount the resulting EBS volume to your AWS file server on Sunday.

C. Leverage the AWS Storage Gateway to create a Gateway-Stored volume. On Friday copy the application data to the Storage Gateway volume. After the data has been copied, perform a snapshot of the volume and restore the volume as an EBS volume to be attached to your AWS file server on Sunday.

## Developer–Associate Level

What is one key difference between an Amazon EBS-backed and an instance-store backed instance?

A. Instance-store backed instances can be stopped and restarted
B. Auto scaling requires using Amazon EBS-backed instances
C. Amazon EBS-backed instances can be stopped and restarted
D. Virtual Private Cloud requires EBS backed instances

## SysOps Administrator–Associate Level

Your web site is hosted on 10 EC2 instances in 5 regions around the globe with 2 instances per region. How could you configure your site to maintain site availability with minimum downtime if one of the 5 regions was to lose network connectivity for an extended period of time?

A. Create an Elastic Load Balancer to place in front of the EC2 instances. Set an appropriate health check on each ELB.
B. Establish VPN Connections between the instances in each region. Rely on BGP to failover in the case of a region wide connectivity outage
C. Create a Route 53 Latency Based Routing Record Set that resolves to an Elastic Load Balancer in each region. Set an appropriate health check on each ELB.
D. Create a Route 53 Latency Based Routing Record Set that resolves to Elastic Load Balancers in each region and has the Evaluate Target Health flag set to true.

Your application has a single Amazon EC2 instance that processes orders with a third-party supplier. Orders are retrieved from an Amazon SQS queue and processed in batches every five minutes. There is a business requirement that delays in processing should be no more than one hour. Approximately three times a week, the application fails and orders stop being processed, requiring a manual restart.

Which steps should you take to make this more resilient in a cost-effective way? (Choose 2)

A. Create a second 'watchdog' instance configured to monitor the processing instance and restart it if a failure is detected.

B. Create an Auto Scaling launch configuration to launch instances configured to perform processing. Create an Auto Scaling group to use the launch configuration with a minimum and maximum of one.

C. Create an Auto Scaling launch configuration to launch instances configured to perform processing. Create an Auto Scaling group to use the launch configuration with a minimum of two and a maximum of ten, and to scale based on the size of the Amazon SQS queue.

D. Create a load balancer and register your instance with Elastic Load Balancing. Set the Elastic Load Balancing health check to call an HTTP endpoint in your application that executes the processing.

E. Modify the processing application to send a custom CloudWatch metric with a dimension of InstanceId. Create a CloudWatch alarm, configured when the metric is in an Insufficient state for 10 minutes, to take an Amazon EC2 action to terminate the instance.

# *How to Prepare for AWS Certification ?*

Some key items you should know before you take the Architect - Associate exam:

- how to configure and troubleshoot a VPC inside and out, including basic IP subnetting
- the difference in use-cases between Simple Workflow (SWF), Simple Queue Services (SQS), and Simple Notification Services (SNS)
- how an Elastic Load Balancer (ELB) interacts with auto-scaling groups in a high-availability deployment
- how to properly secure a S3 bucket in different usage scenarios
- when it would be appropriate to use either EBS-backed or ephemeral instances
- basic understanding of CloudFormation
- how to properly use various EBS volume configurations and snapshots to optimize I/O performance and data durability

Did you know?

*"There are 3.9 million jobs in the U.S. affiliated with cloud computing today with 384,478 in IT alone. The median salary for IT professionals with cloud computing experience is $90,950 and the median salary for positions that pay over $100,000 a year is $116,950.Globally there are 18,239,258 cloud computing jobs,"*

(Forbes.com)

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