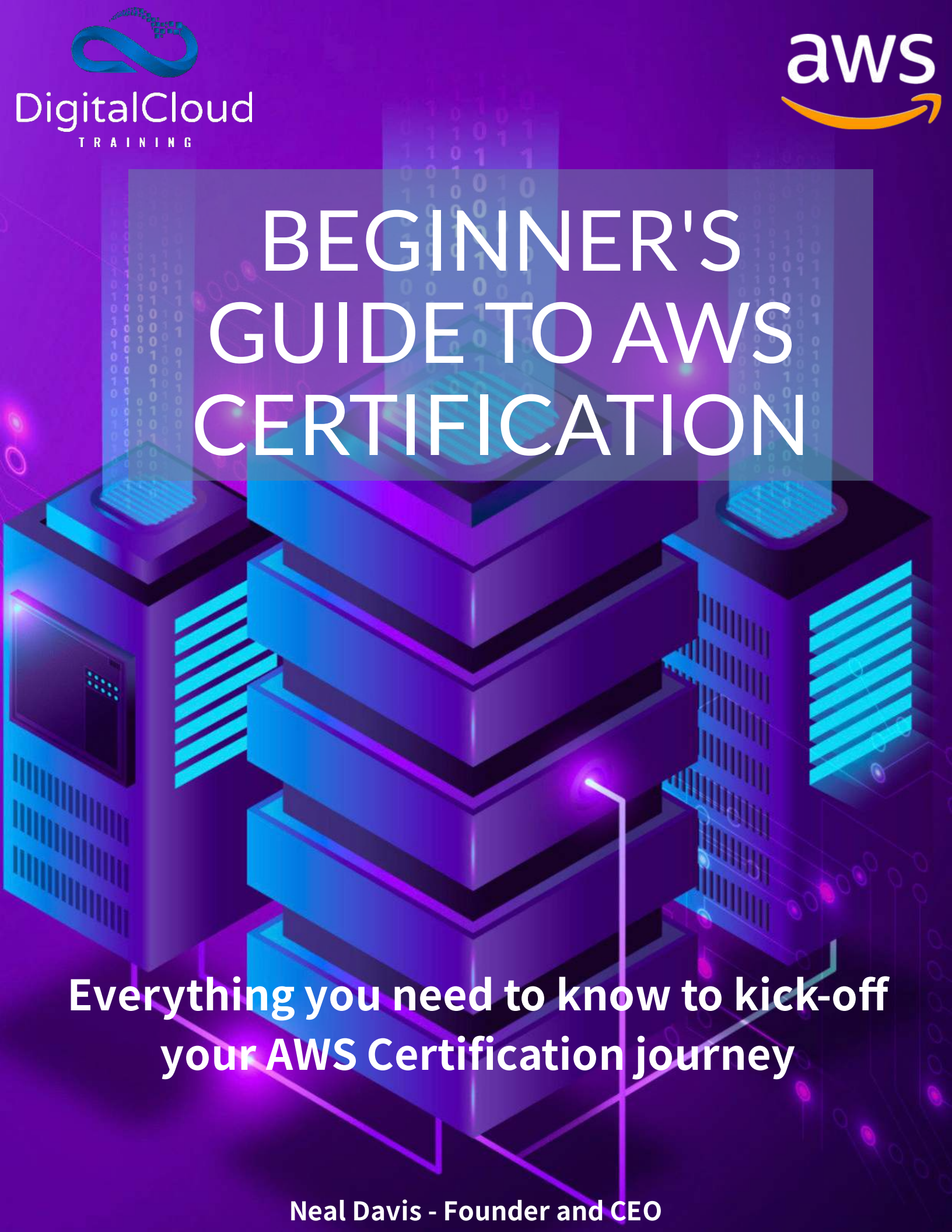
DigitalCloud
TRAINING

aws

BEGINNER'S GUIDE TO AWS CERTIFICATION



Everything you need to know to kick-off your AWS Certification journey

Neal Davis - Founder and CEO

Overview

You may be well aware of the massive growth in the popularity of cloud computing. You may have heard of Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP). But are you aware of the huge employment opportunities and great salaries that can be earned by cloud engineers, cloud architects, and cloud developers?

A career in cloud computing can be rewarding at many levels. It offers the opportunity to work with cutting edge technology, there are many employment opportunities and interesting career paths to pursue, and salaries can be very generous.

What's more, getting started with your career in the cloud is easier than you might think. In this guide, you'll learn about the opportunities that are available and what you can do to take advantage of them.

What is Cloud Computing?

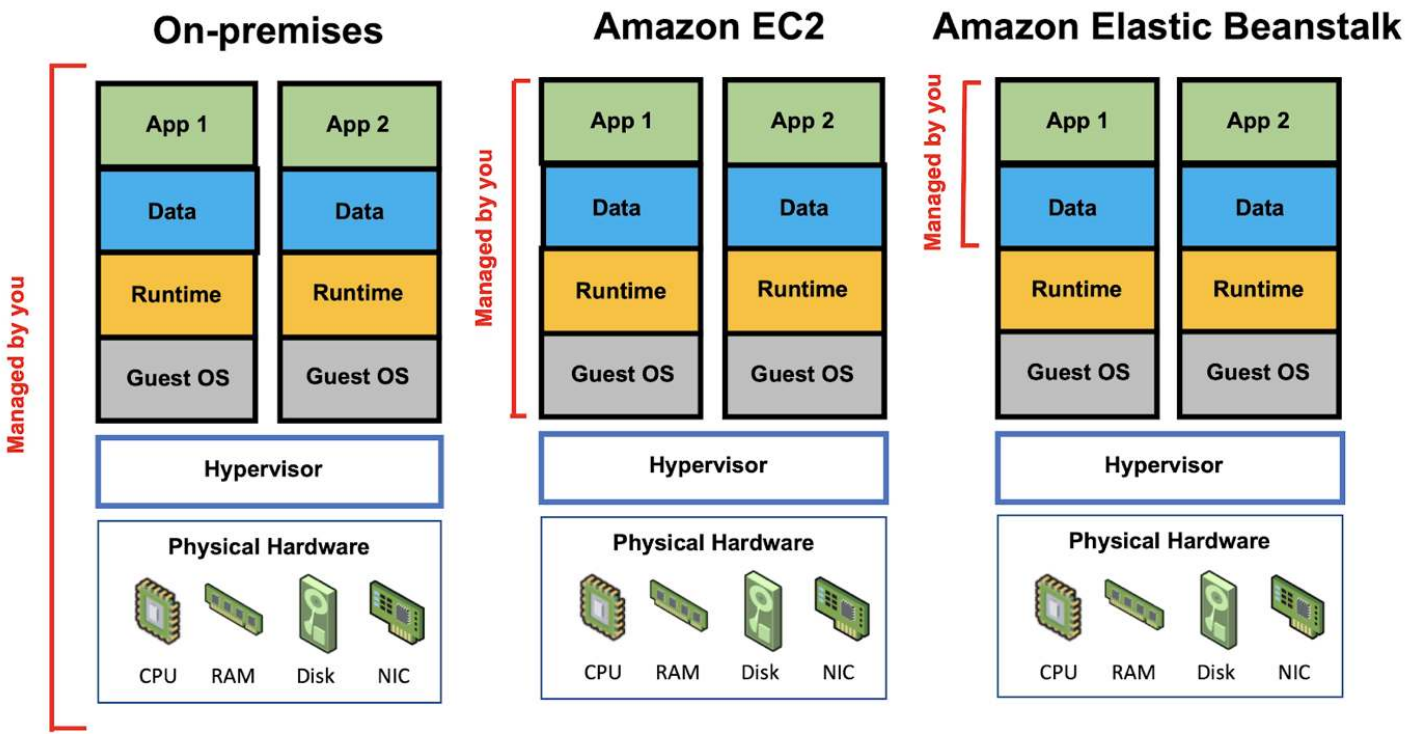
Fundamentally cloud computing is the delivery of IT services that can be consumed on a flexible basis where you pay only for what you actually use in a given month. This means organizations can essentially "rent" or "lease" the IT services they need to use to run their business from a cloud computing provider.

This model of computing allows a lot of flexibility as the companies can expand and contract their usage as demand for their services changes and they only pay for what they actually use. Because the service is flexible (or "elastic") they are not locked into fixed-term contracts.

For example, you might migrate your on-premises Linux or Windows servers to the Amazon Elastic Compute Cloud (EC2) which offers virtual servers in the cloud. In that case, the data center, server and storage hardware, networking, and the virtual platform are managed for you. All you need to manage is the operating system and application.

You may have a team of developers who don't want to even manage the operating system or runtime environment. In that case they could use Amazon Elastic Beanstalk which manages it all for them. The developers only need to manage their code.

The figure below shows who manages what with on-premises infrastructure, Amazon EC2, and Amazon Elastic Beanstalk.



In another example, you may be able to migrate an API and application code to Amazon API Gateway and AWS Lambda. These services are "serverless" so you don't manage anything except your code. They will scale seamlessly and are extremely cost-effective. Serverless services are becoming very popular due to these significant advantages.

Another key advantage of cloud computing is that it reduces capital expenditure (CAPEX) as it is mainly an operational expenditure (OPEX). That means you don't need to shell out a huge sum of money to purchase equipment, instead you pay a monthly fee for using the cloud providers equipment which assists with cash flow and accounting optimization.

Cloud computing has been growing at an increasing rate for several years and in a post-COVID-19 world, I believe takeup will be even faster. Why? Because to survive today companies must be agile enough to withstand downturns and competitive pressures. If your business slows down and you're in the cloud, your bills go down too. If you're not in the cloud, they don't.

What is Amazon Web Services (AWS)?

Amazon Web Services, or AWS, is a subsidiary of Amazon. AWS provides on-demand cloud computing services to consumers on a metered pay-as-you-go basis. They are the leading cloud computing provider with the largest selection of services and the biggest customer base.

AWS offers over 200 services including computing, storage, networking, database, analytics, media services, machine learning, management, mobile, and IoT services. These services are delivered from data centers around the world and there are 26 regions, 84 availability zones, and 310 points of presence at the time of writing.

AWS is considered to be the leading provider of cloud services with revenues of over $45 billion in 2020, and a whopping 30% growth. AWS has also been named as a Leader in Gartner's Infrastructure as a Service (IaaS) magic quadrant for 11 consecutive years in 2021.

The figure below shows how AWS earned the highest placement for Ability to Execute and furthest for Completeness of Vision in Gartner's Magic Quadrant for Cloud Infrastructure as a Service (IaaS):

Figure 1: Magic Quadrant for Cloud Infrastructure and Platform Services

Source: Gartner (July 2021)

Why work in Cloud Computing?

As you're probably starting to realize, cloud computing is a really good space to be in today and its constant growth indicates that it will continue to be a great industry to work in for the foreseeable future. Here are some of the top reasons why you should work in cloud:

1. **Job demand** - due to the huge, continuing growth of the take up of cloud services, there will be ongoing demand for qualified and experienced professionals.
2. **Skills are globally relevant** - cloud computing providers such as AWS provide services to customers around the world so you can take advantage of job opportunities globally.
3. **Rewarding career paths** - if you have a passion for technology, working in cloud computing will be one of the most exciting and rewarding careers and provides significant opportunities for career growth
4. **Great salaries** - according to payscale.com, average salaries in the US exceed $127,000 per annum.

Why get AWS Certified?

Certifications are a great way to demonstrate your skills to potential employers or to get a promotion into your target job role. With AWS dominating the world of cloud computing and many companies moving services into the cloud, AWS certifications are some of the most sought-after certifications.

AWS certifications are designed to test both theoretical and practical knowledge so the training programs for getting certified should always include both of these elements. Therefore, you can build practical skills by taking a certification training course that will help you perform well in your cloud computing job role once you get it.

Training for certifications also provides knowledge that you can practically use in your current role even if you don't work with cloud services today. Most IT roles involve some level of exposure to cloud computing (and very likely AWS). If your role doesn't, it probably will very soon. Therefore, it's wise to get ahead of the curve and make sure your skills are relevant in today's market.

Which AWS Certification is right for you?

As an instructor and creator of AWS certification resources for Digital Cloud Training, many people ask me what the best way is to get started with learning AWS. The certification tracks include the Cloud Practitioner certification and the Associate and Professional certification levels as well as the specialty track.

There are no prerequisites and you can get started with any certification you choose. However, the path you should take really depends on your background, goals, and the type of role you perform.

The image below shows the AWS certifications at the foundational, associate and professional levels and the specialty certifications.

Foundation Level

The foundational level includes a single certification: AWS Certified Cloud Practitioner. This certification is focussed on basic cloud concepts including a high-level understanding of AWS cloud services and their typical use cases, support, pricing, architectural best practices, and the AWS global infrastructure.

Those who are new to cloud computing or whose job roles do not require a deeper level of knowledge may choose to get started with the AWS Cloud Practitioner certification. This might include sales, pre-sales, 1st line support staff, and managers.

> The Cloud Practitioner exam is composed of 65 questions and you have 90 minutes to complete it with a passing score of 700 points out of 1000.

The questions that are asked are straightforward; these are not the lengthy scenario-based questions you will find in other certification tracks.

Associate Level

If your job role requires a deeper level of knowledge there are then three associate-level tracks. These are the Solutions Architect, SysOps Administrator, and Developer Associate. You should choose which track to follow based on your job role.

For example, if you work in the systems operations space you might choose the SysOps Administrator – Associate and if you are a Solutions Architect you would choose the Solutions Architect – Associate.

The associate level exams are a big step up in difficulty from the Cloud Practitioner but nowhere near as difficult as the professional level. The scope of the associate level certifications is broad, but the depth of knowledge required is relatively shallow.

While the Cloud Practitioner is suitable for those with no AWS experience, it is recommended that you have at least one year of hands-on experience with AWS before you take the associate level exams.

The exams are composed of 65 questions in 130 minutes, and all questions are scenario-based. You must score at least 720 points out of 1000. The scenarios are usually just one or two paragraphs long.

As with the Cloud Practitioner exam, the format for the questions is one of the following:

- Multiple-choice: Has one correct answer and three incorrect answers (distractors)
- Multiple-response: Has two or more correct responses out of five or more options

The difference with associate (and higher) level questions is that the distractors (incorrect answers) are options that may be correct but are not the best options.

This makes the associate level questions harder as you need to understand the performance, design, security, availability, and operational implications of each answer and select the best solution available.

Please note that in July 2021, AWS introduced an exam labs component for the AWS SysOps Administrator Associate exam (SOA-C02). This is the first certification for which AWS has introduced a hands-on testing experience

Professional Level

The next level is the professional level which is the highest level of certification on AWS technology (the specialty certifications sit alongside professional level).

The professional level certifications cover a broad scope but at a much deeper level than the Associate certifications.

It is recommended that you have at least 2 years of hands-on experience designing and deploying cloud architectures on AWS before taking this exam.

There are two tracks available: Solutions Architect – Professional, DevOps Engineer Professional. You should choose the track that most closely matches your job role and experience.

The professional level is another big step up in difficulty. The exam is also scenario-based with the scenarios being lengthier and more complex.

> *You get 75 questions and 180 minutes to complete the exam with a passing score of 750 points out of 1000.*

Many examinees struggle with time management in this exam due to the difficulty of the questions. The distractors are often difficult to eliminate as they provide viable solutions, and you need a solid understanding of the service's limitations, use cases, and best practices.

In the past, you needed to pass the associate level certification from the relevant track (Solutions Architect, SysOps Administrator, Developer Associate) before you could take the professional level exam. This prerequisite was removed so if you have the knowledge and experience you can get straight into the professional level.

Specialty Certifications

These certifications vary in difficulty with some being similar to the professional level in terms of overall difficulty. However, the specialty examinations focus on much narrower topics with a deeper level of knowledge required in the specific subject area.

Make sure you know everything there is to know about your specialty subject before taking one of these exams. There are currently 6 specialty certifications available. These are:
AWS Certified Data Analytics - Specialty

- AWS Certified Advanced Networking - Specialty
  AWS Certified Database - Specialty
- AWS Certified Security - Specialty
- AWS Certified Machine Learning - Specialty
- AWS Certified Data Analytics - Specialty
- AWS Certified SAP on AWS - Specialty

The prerequisites can be quite high for these certifications. For example, with the security specialty AWS recommends a minimum of 5 years of IT security experience with at least 2 years of hands-on experience securing AWS workloads.

> *The exams include 65 questions and you get 170 minutes for completion with a passing score of 750 points out of 1000.*

What to expect in the Exam

If you're starting out with your career in AWS and looking to get certified, you'll probably start at either the foundational or associate level. In this section of the guide, you'll learn what to expect in certification exams related to these levels. These are the AWS Certified Cloud Practitioner and AWS Certified Solutions Architect - Associate.

1. Foundational Level - AWS Certified Cloud Practitioner

As a foundational level exam, the AWS Certified Cloud Practitioner is intended for individuals who have the ability to, in Amazon's words, "effectively demonstrate an overall understanding of the AWS Cloud". This certification is fairly generic and does not assess the skills required for specific job roles such as Developers, Sysops Administrators, and Solutions Architects.

AWS recommends you have a minimum of 6 months' experience with the AWS Cloud. However, this does not need to be experienced in a technical job role. Exposure to the AWS Cloud in a managerial, sales, purchasing, or financial position is also acceptable.

The question format of the exam is multiple-choice (one correct response from four options) and multiple-response (two correct responses from five options).

The questions are fairly straightforward compared to other exams such as the Associate and Professional level certifications.

In the AWS Certified Cloud Practitioner exam blueprint, it is stated that the exam validates an examinee's ability to:

- Define what the AWS Cloud is and the basic global infrastructure
- Describe basic AWS Cloud architectural principles
- Describe the AWS Cloud value proposition
- Describe key services on the AWS platform and their common use cases(for example, compute and analytics)
- Describe basic security and compliance aspects of the AWS platform and the shared security model
- Define the billing, account management, and pricing models
- Identify sources of documentation or technical assistance (for example, whitepapers or support tickets)
- Describe basic/core characteristics of deploying and operating in the AWS Cloud

Domains, Objectives and Examples

The knowledge required is organized into four test "domains". Within each test domain, there are several objectives that broadly describe the knowledge and experience expected to pass the exam.

Test Domain 1: Cloud Concepts

This domain makes up 26% of the exam and includes the following three objectives:

1. Define the AWS Cloud and its value proposition
2. Identify aspects of AWS Cloud economics
3. List the different cloud architecture design principles

What you need to know

You should be able to describe the benefits of public cloud services and be able to define what types of services are available on AWS (think IaaS, PaaS, SaaS). Make sure you understand the 6 advantages of cloud:

1. Trade capital expense for variable expense
2. Benefit from massive economies of scale
3. Stop guessing about capacity
4. Increase speed and agility
5. Stop spending money running and maintaining data centers
6. Go global in minutes

You need to know how cloud is beneficial from a financial perspective and should understand the difference between CAPEX and OPEX - this relates to item 1 in the list above.

You should understand the design principles of creating cloud architectures, this includes loose coupling, scaling (vertically and horizontally), bootstrapping and automation, to name just a few.

The AWS blog article "The 5 Pillars of the Well-Architected Framework" is essential reading, as is the whitepaper "Architecting for the Cloud: Best Practices".

Example questions

Question: Which feature of AWS allows you to deploy a new application for which the requirements may change over time?

1. Elasticity
2. Fault tolerance
3. Disposable resources
4. High availability

Answer: 1, elasticity allows you to deploy your application without worrying about whether it will need more or less resources in the future. With elasticity, the infrastructure can scale on-demand

Question: What advantages do you get from using the AWS cloud? (choose 2)

1. Trade capital expense for variable expense
2. Stop guessing about capacity
3. Increased capital expenditure
4. Gain greater control of the infrastructure layer
5. Comply with all local security compliance programs

Answer: 1+2, with public cloud services such as AWS you can pay on a variable (OPEX) basis for the resources you use and scale on-demand, so you never need to guess how much resources you need to deploy.

Test Domain 2: Security

This domain makes up 25% of the exam and includes the following four objectives:

- 2.1 Define the AWS Shared Responsibility model.
- 2.2 Define AWS Cloud security and compliance concepts.
- 2.3 Identify AWS access management capabilities.
- 2.4 Identify resources for security support.

What you need to know

You should understand the AWS shared responsibility model which defines who is responsible for different aspects of the technology stack from the data center through to servers, firewall rules, and data encryption.

AWS provides tools and services for implementing security, assessing your security position, and generating alerts and compliance reports. You need to understand these services and tools well enough to describe their usage and benefits. This includes services such as KMS, CloudTrail, and AWS Artifact.

You also need to understand the services that are used for authentication, authorization, and access management. This includes services such as AWS IAM, and Amazon Cognito, and the usage of access keys, key pairs, and signed URLs.

Support services include real-time insights through AWS Trusted Advisor and proactive support and advocacy with a Technical Account Manager (TAM). Make sure you know which support packages include a TAM.

Example questions

Question: Under the AWS shared responsibility model what is the customer responsible for? (choose 2)

1. Physical security of the data center
2. Replacement and disposal of disk drives
3. Configuration of security groups
4. Patch management of infrastructure
5. Encryption of customer data

Answer: 3+5, AWS are responsible for items such as the physical security of the DC, replacement of old disk drives, and patch management of the infrastructure whereas customers are responsible for items such as configuring security groups, network ACLs, patching their operating systems and encrypting their data.

Question: Which AWS service is used to enable multi-factor authentication?

1. Amazon STS
2. AWS IAM
3. Amazon EC2
4. AWS KMS

Answer: 2, IAM is used to securely control individual and group access to AWS resources and can be used to manage multi-factor authentication.

Test Domain 3: Technology

This domain makes up 33% of the exam and includes the following four objectives:

- 3.1 Define methods of deploying and operating in the AWS Cloud
- 3.2 Define the AWS global infrastructure
- 3.3 Identify the core AWS services
- 3.4 Identify resources for technology support

What you need to know

You need to understand the core AWS services and what they are used for. You typically don't need a deep level of knowledge of the specifics of a service but do need to understand its purpose, benefits, and use cases.

Core services include EC2, ECS, Lambda, LightSail, EBS, EFS, S3, RDS, DynamoDB, RedShift, ElastiCache, Elastic Load Balancing, Auto Scaling, CloudFront, Route 53, CloudWatch, CloudTrail, and SNS.

You should understand the underlying global infrastructure that makes up the AWS Cloud. This includes regions, availability zones, and edge locations. Make sure you understand which services are globally or regionally defined.

You should also know the customer configurable building blocks of cloud services including VPCs, and subnets, and connectivity options such as Internet Gateways, VPN and Direct Connect. Also, ensure you know the difference between NAT Instances and NAT Gateways and the relative benefits of each service.

Example questions

Question: What are the advantages of Availability Zones? (choose 2)

1. They allow regional disaster recovery
2. They provide fault isolation
3. They enable the caching of data for faster delivery to end users
4. They are connected by low-latency network connections
5. They enable you to connect your on-premises networks to AWS to form a hybrid cloud

Answer: 2+4, Each AWS region contains multiple distinct locations called Availability Zones (AZs). Each AZ is engineered to be isolated from failures in other AZs. An AZ is a data center, and in some cases, an AZ consists of multiple data centers. AZs within a region provide inexpensive, low-latency network connectivity to other zones in the same region. This allows you to replicate your data across data centers in a synchronous manner so that failover can be automated and be transparent for your users.

Question: Which AWS support plans provide support via email, chat and phone? (choose 2)

1. Basic
2. Business
3. Developer
4. Global
5. Enterprise

Answer: 2+5, only the business and enterprise plans provide support via email, chat and phone.

Test Domain 4: Billing and Pricing

This domain makes up 16% of the exam and includes the following three objectives:

- 4.1 Compare and contrast the various pricing models for AWS
- 4.2 Recognize the various account structures in relation to AWS billing and pricing
- 4.3 Identify resources available for billing support

What you need to know

Most services on AWS are offered on a pay per use basis, but there are also options to reduce the price by locking into 1 or 3-year contracts with various options for payment. You need to understand these models and which services they apply to.

Make sure you understand what AWS charges you for and what is free of charge. For instance, inbound data transfer is free whereas outbound data transfer typically incurs costs.

Some services such as VPC, CloudFormation, and IAM are free but the resources you create with them may not be. You need to understand where costs may be incurred.

AWS accounts can be organized into Organizations for centralized management of policies and consolidated billing. You need to understand the various accounts structures and the benefits and use cases for implementing them.

For instance, you might want separate account structures to manage different policies for production and non-production resources, or you might implement consolidated billing to take advantage of volume discounts.

For billing support, you need to know the services and tools available to you and what levels of support you can get from AWS support plans.

Tools include AWS Cost Explorer, AWS Simple Monthly Calculator, and Total Cost of Ownership (TCO) calculator.

Example questions

Question: What are two ways an AWS customer can reduce their monthly spend? (choose 2)

1. Turn off resources that are not being used
2. Use more power efficient instance types
3. Reserve capacity where suitable
4. Be efficient with usage of Security Groups
5. Reduce the amount of data ingress charges

Answer: 1+3, turning off resources that are not used can reduce spend. You can also use reserved instances to reduce the monthly spend at the expense of having to lock into a 1 or 3-year contract – good for stable workloads.

Question: A company would like to maximize their potential volume and RI discounts across multiple accounts and also apply service control policies on member accounts. What can they use to achieve these benefits?

1. AWS Budgets
2. AWS Cost Explorer
3. AWS IAM
4. AWS Organizations

Answer: 4, AWS Organizations enables you to create groups of AWS accounts and then centrally manage policies across those accounts. AWS Organizations provides consolidated billing in both feature sets, which allows you to set up a single payment method in the organization's master account and still receive an invoice for individual activity in each member account. Volume pricing discounts can be applied to resources.

2. Associate Level - AWS Certified Solutions Architect - Associate

This exam is within the Associate level in the AWS training program and is recommended for individuals with a least one year of hands-on experience. The exam is intended for Solutions Architects and requires you to demonstrate knowledge of how to define a solution using architectural design principles based on customer requirements and provide implementation guidance based on best practices to the organization throughout the lifecycle of the project.

In the "AWS Certified Solutions Architect – Associate SAA-C02 Exam Guide", the following AWS knowledge is recommended:

- 1 year of hands-on experience designing available, cost-effective, fault-tolerant, and scalable distributed systems on AWS.
- Hands-on experience using compute, networking, storage, and database AWS services.
- Hands-on experience with AWS deployment and management services.
- Ability to identify and define technical requirements for an AWS-based application.
- Ability to identify which AWS services meet a given technical requirement.
- Knowledge of recommended best practices for building secure and reliable applications on AWS.
- An understanding of the basic architectural principles of building in the AWS Cloud.
- An understanding of the AWS global infrastructure.
- An understanding of network technologies as they relate to AWS.
- An understanding of security features and tools that AWS provides and how they relate to traditional services.

The exam includes 65 questions and has a time limit of 130 minutes. You need to score a minimum of 720 out of 1000 points to pass the exam.

The question format of the exam is multiple-choice (one correct response from four options) and multiple-response (two correct responses from five options).

With many questions in the AWS Solutions Architect Associate exam, you will find there are multiple correct answers and you must select the answer that best fits the scenario. For instance, you may be asked to select the MOST secure, MOST cost-effective, BEST architecture, or LEAST complex option.

Important: be very careful reading the wording of the question to ensure you select correctly! Sometimes small details can be easily missed that change the answer so take your time when sitting the exam.

Domains, Objectives and Examples

The knowledge required is organized into four test “domains”. Within each test domain, there are several objectives that broadly describe the knowledge and experience expected to pass the exam.

Domain 1: Design Resilient Architectures

This domain makes up 30% of the exam and includes the following four objectives:

- 1.1 Design a multi-tier architecture solution
- 1.2 Design highly available and/or fault-tolerant architectures
- 1.3 Design decoupling mechanisms using AWS services
- 1.4 Choose appropriate resilient storage

What you need to know

You need to understand the various block, file, and object storage technologies such as Amazon EBS, Instance Store, Amazon EFS, and Amazon S3, and know their use cases.

You must be able to design multi-tier application architectures and know-how to decouple application components using technologies such as Amazon SQS and Amazon SWF.

The architectures also need to be highly available in the case of component failure, and able to recover in the case of major outages, so you need to know the various ways of implementing high availability and fault tolerance.

Technologies you need to understand include Amazon Elastic Load Balancing, Amazon Route 53, and Amazon RDS Read Replicas and Multi-AZ.

You also need to understand the AWS Global Infrastructure in order to determine how to design application stacks to best use the underlying infrastructure architecture.

Example questions

Question: You are a Solutions Architect at a media company and you need to build an application stack that can receive customer comments from sporting events. The application is expected to receive significant load that could scale to millions of messages within a short space of time following high-profile matches.

As you are unsure of the load required for the database layer what is the most cost-effective way to ensure that the messages are not dropped?

1. Use RDS Auto Scaling for the database layer which will automatically scale as required
2. Create an SQS queue and modify the application to write to the SQS queue. Launch another application instance the polls the queue and writes messages to the database
3. Write the data to an S3 bucket, configure RDS to poll the bucket for new messages
4. Use DynamoDB and provision enough write capacity to handle the highest expected load

Answer: 2, Amazon Simple Queue Service (Amazon SQS) offers a reliable, highly-scalable, hosted queue for storing messages in transit between computers and is used for distributed/decoupled applications. This is a great use case for SQS as you don't have to over-provision the database layer or worry about messages being dropped.

Question: A new Big Data application you are developing will use hundreds of EC2 instances to write data to a shared file system. The file system must be stored redundantly across multiple AZs within a region and allow the EC2 instances to concurrently access the file system. The required throughput is multiple GB per second.

From the options presented which storage solution can deliver these requirements?

1. Amazon EBS using multiple volumes in a RAID 0 configuration
2. Amazon S3
3. Amazon EFS
4. Amazon Storage Gateway

Answer: 3, Amazon EFS is the best solution as it is the only solution that is a file-level storage solution (not block/object-based), stores data redundantly across multiple AZs within a region and you can concurrently connect up to thousands of EC2 instances to a single filesystem.

Domain 2: Design High-Performing Architectures

This domain makes up 28% of the exam and includes the following four objectives:

- 2.1 Identify elastic and scalable compute solutions for a workload
- 2.2 Select high-performing and scalable storage solutions for a workload
- 2.3 Select high-performing networking solutions for a workload
- 2.4 Choose high-performing database solutions for a workload

What you need to know

You need to be able to select the best storage and database services to use for a given scenario, taking into account requirements for performance.

Technologies to increase performance may include a caching layer such as Amazon ElastiCache, Amazon DynamoDB DAX, or Amazon CloudFront and you must be able to select the best service to use in the situation presented.

You must know how to effectively implement elasticity and scalability to your application architectures. This means understanding at an architectural and implementation level what to use and how to build it.

Elasticity and scalability services you need to understand include AWS Auto Scaling, EC2 Auto Scaling, and how to implement these features at the application, storage, and database layers of your application using AWS technology.

Example questions

Question: A developer is creating a solution for a real-time bidding application for a large retail company that allows users to bid on items of end-of-season clothing. The application is expected to be extremely popular and the back-end DynamoDB database may not perform as required.

How can the Solutions Architect enable in-memory read performance with microsecond response times for the DynamoDB database?

1. Configure DynamoDB Auto Scaling
2. Enable read replicas
3. Increase the provisioned throughput
4. Configure Amazon DAX

Answer: 4, Amazon DynamoDB Accelerator (DAX) is a fully managed, highly available, in-memory cache for DynamoDB that delivers up to a 10x performance improvement – from milliseconds to microseconds – even at millions of requests per second. You can enable DAX for a DynamoDB database with a few clicks.

Question: A Solutions Architect is designing a workload that requires a high-performance object-based storage system that must be shared with multiple Amazon EC2 instances.

Which AWS service delivers these requirements?

1. Amazon S3
2. Amazon EFS
3. Amazon EBS
4. Amazon ElastiCache

Answer: 1, Amazon S3 is an object-based storage system. Though object storage systems aren't mounted and shared like filesystems or block-based storage systems, they can be shared by multiple instances as they allow concurrent access.

Domain 3: Design Secure Applications and Architectures

This domain makes up 24% of the exam and includes the following three objectives:

- 3.1 Design secure access to AWS resources
- 3.2 Design secure application tiers
- 3.3 Select appropriate data security options

What you need to know

You need to understand how to use native AWS technologies and solution architecture to create secure applications. This includes configuring security controls for authentication, authorization, and access and applying encryption to data.

You need to know how to design isolation and separation through AWS service architecture, Amazon EC2 instance deployment options and Amazon VPC configuration.

It is also recommended to understand the best practices for implementing services in the most secure manner and best practices for creating users, groups, and roles using AWS IAM. Which services can use multi-factor authentication is also required knowledge and you should understand the available AWS Directory Services at a high-level and when to use them.

Questions often come up asking you to identify which technologies include DDoS mitigation and these include AWS Auto Scaling, Amazon CloudFront, and Amazon Route 53.

You should also know how to implement monitoring and logging using Amazon CloudWatch and AWS CloudTrail, when and what penetration testing you are allowed to perform within the AWS cloud, and what compliance programs AWS complies with.

Technologies you need to know for domain 3 include Amazon VPC, AWS KMS, AWS CloudHSM, AWS IAM, Amazon Cognito, and AWS Directory Services.

Example questions

Question: The development team at your company have created a new mobile application that will be used by users to access confidential data. The developers have used Amazon Cognito for authentication, authorization, and user management. Due to the sensitivity of the data, there is a requirement to add another method of authentication in addition to a username and password.

You have been asked to recommend the best solution. What is your recommendation?

1. Integrate IAM with a user pool in Cognito
2. Enable multi-factor authentication (MFA) in IAM
3. Integrate a third-party identity provider (IdP)
4. Use multi-factor authentication (MFA) with a Cognito user pool

Answer: 4, You can use MFA with a Cognito user pool (not in IAM) and this satisfies the requirement. A user pool is a user directory in Amazon Cognito. With a user pool, your users can sign in to your web or mobile app through Amazon Cognito. Your users can also sign in through social identity providers like Facebook or Amazon, and through SAML identity providers.

Question: You have been asked to come up with a solution for providing single sign-on to existing staff in your company who manage on-premise web applications and now need access to the AWS management console to manage resources in the AWS cloud.

Which product combinations provide the best solution to achieve this requirement?

1. Use your on-premise LDAP directory with IAM
2. Use IAM and MFA
3. Use the AWS Secure Token Service (STS) and SAML
4. Use IAM and Amazon Cognito

Answer: 3, Single sign-on using federation allows users to log-in to the AWS console without assigning IAM credentials. The AWS Security Token Service (STS) is a web service that enables you to request temporary, limited-privilege credentials for IAM users or for users that you authenticate (such as federated users from an on-premise directory). Federation (typically Active Directory) uses SAML 2.0 for authentication and grants temporary access based on the users' AD credentials. The user does not need to be a user in IAM.

Domain 4: Design Cost-Optimized Architectures

This domain makes up 18% of the exam and includes the following three objectives:

- 4.1 Identify cost-effective storage solutions
- 4.2 Identify cost-effective compute and database services
- 4.3 Design cost-optimized network architectures

What you need to know

A relatively small but still important area of the exam requires architects to consider cost-effectiveness when deploying an application on AWS. You need to understand the various cost models of compute and storage services, what you pay for, and what the best choices would be given a specific scenario.

Example questions

Question: You need to run a production batch process quickly that will use several EC2 instances. The process cannot be interrupted and must be completed within a short time period.

What is likely to be the MOST cost-effective choice of EC2 instance type to use for this requirement?

1. Reserved instances
2. Spot instances
3. On-demand instances
4. Flexible instances

Answer: 3, the key requirements here are that you need to deploy several EC2 instances quickly to run the batch process and you must ensure that the job completes. The on-demand pricing model is the best for this ad-hoc requirement as though spot pricing may be cheaper you cannot afford to risk the instances being terminated by AWS when the market price increases.

Question: An Architect is designing a serverless application that will accept images uploaded by users from around the world. The application will make API calls to back-end services and save the session state data of the user to a database.

Which combination of services would provide a solution that is cost-effective while delivering the least latency?

1. Amazon CloudFront, API Gateway, Amazon S3, AWS Lambda, DynamoDB
2. API Gateway, Amazon S3, AWS Lambda, DynamoDB
3. Amazon CloudFront, API Gateway, Amazon S3, AWS Lambda, Amazon RDS
4. Amazon S3, API Gateway, AWS Lambda, Amazon RDS

Answer: 1, Amazon CloudFront caches content closer to users at Edge locations around the world. This is the lowest latency option for uploading content. API Gateway and AWS Lambda are present in all options. DynamoDB can be used for storing session state data.

How to best prepare for your AWS Exam

AWS certification exams can be challenging and test both theoretical knowledge and your level of practical experience. You must therefore ensure your training plan covers each of these areas. I recommend using the following 5 steps as a framework for your training plan:

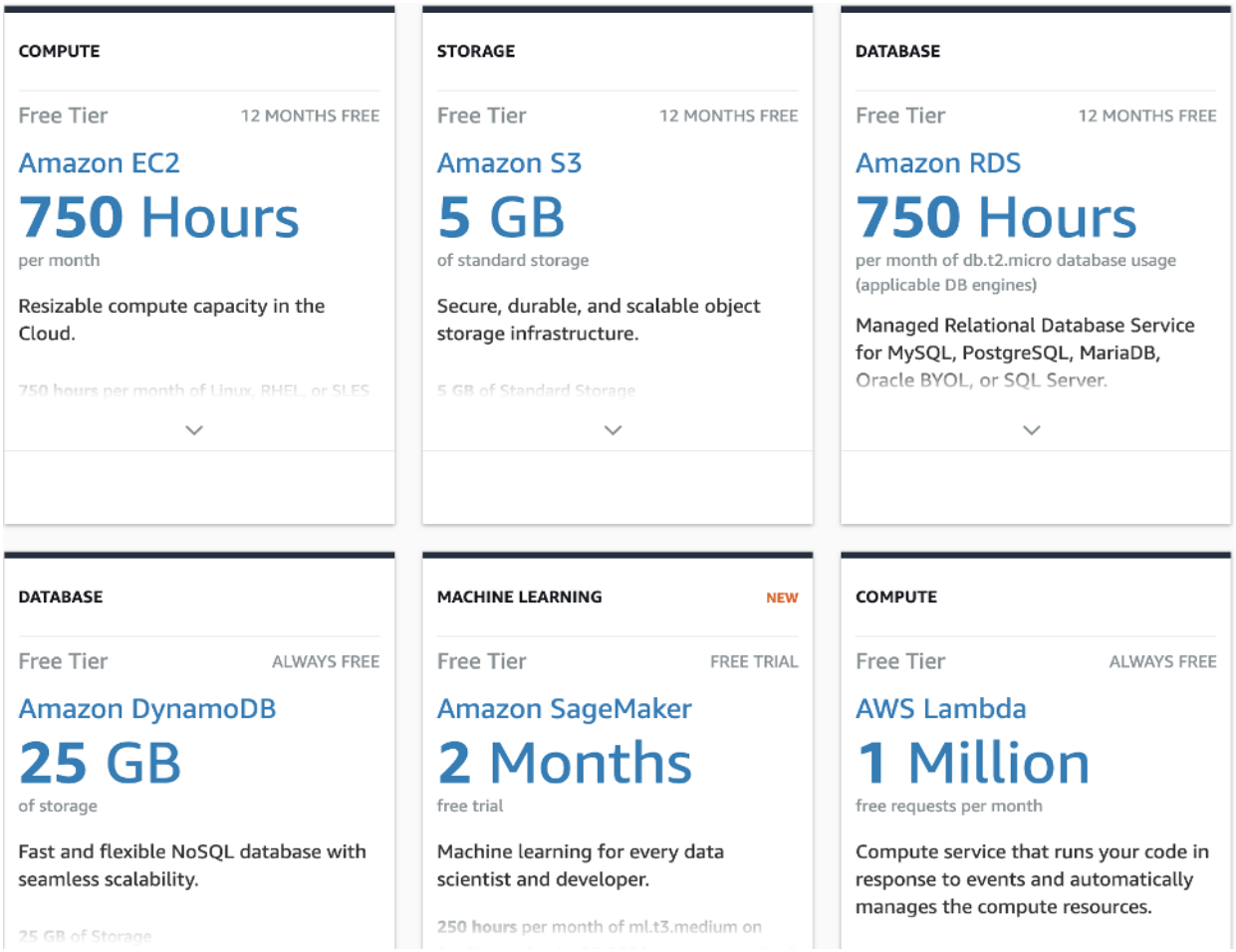
1. Practical (hands-on)
2. Video-based Training
3. Theory (reading)
4. Practice questions
5. Taking the exam

Step 1 - Practical (Hands-on)

One of the keys to learning any technology is to actually use it. If you don't work with AWS, don't worry. Not everyone has the chance to work with the technologies they're studying in a professional context and many of our students have passed their exams without actual on-the-job experience.

With AWS you can set up an account for free and the free tier allows you to use specific AWS services at no cost. Just go to: https://aws.amazon.com/free

The free tier offers plenty for free every month including (but not limited to):



This is a great way to get experience and you can bring stuff up and tear it down again without it costing you a cent. It's amazing how much you can do in the free tier for a whole year! Just make sure that in Step 2 you choose a video training course that offers lots of hands-on labs to get you practicing.

For those who want to eliminate the risk of running up any bills, Digital Cloud Training offers guided Challenge Labs. Run in a hosted cloud environment, Challenge Labs provide safe practice opportunities.

While beginners follow step-by-step instructions in the guided challenge labs, experts are presented with a scenario and a series of tasks.

These scenario-based hands-on exercises provide our learners with the opportunity to gain practical, real-world cloud skills. For more information, visit: https://digitalcloud.training/hands-on-challenge-labs/

Step 2 - Video-based Training

Online video-based training is an awesome tool. There are many great online courses for AWS certification that allow you to just sit back and soak it all up. The great thing about video is you have an expert and experienced instructor who can help guide you through the technology and point out useful tips for passing the exam.

Courses can vary from death-by-powerpoint to heavily lab centric and this is where the problem with using them in isolation lies. The courses that are heavy in content can be very dry and tedious, and some of the more practical courses are light on content and don't provide all the facts you need to know for the exam.

At Digital Cloud Training we balance this out with a combination of theoretical discussions backed by diagrams and animations, and lots of practical exercises for each topic. We also include detailed exam-specific cheat sheets for each course so you can revise the facts. This combination of visual, practical and theoretical training helps greatly with learning and retention of knowledge.

Step 3 - Theory (Reading)

Some people find this the boring part but there's no substitute for theory and lots of reading is always necessary. I like to get plenty of hands-on practice with a technology before I get stuck into the theory which really helps things to make sense (and keep it interesting). It's important to keep practicing as you gain more knowledge – use it or you lose it!

My strategy when learning theory is to take copious notes. When watching online courses, I also take notes of the key facts. Having concise, summarized training notes becomes really valuable when you're trying to remember thousands of facts, as you can refer back at any time without having to read lengthy articles.

While the AWS website has a great amount of information, it can feel overwhelming at times to deal with such a vast amount of information. That's why our students love the training notes from Digital Cloud Training - where we consolidate all of the important information into one ebook.

We offer these detailed exam-specific cheat sheets for each of our courses. These cheat sheets (or "training notes") can be hundreds pages long and are packed with the specific facts you need to remember to pass the exam. They also match what is taught in our courses so they're a great tool to reinforce knowledge.

Step 4 - Practice Questions

One of the most important tools to use to both learn and evaluate your readiness for the exam is practice questions. Using high quality practice questions helps you to understand the types of questions you're likely to encounter in the exam and can help you to identify areas of weakness.

The challenge however is finding good quality practice questions. There have always been lots of exam dumps on the Internet and various companies serving up low-quality questions (that they generally copy from each other).

These can be incredibly misleading and the questions are often written in poor English, the answers are incorrect, and the explanations (if there are any) are confusing. Remember, AWS changes fast so the questions need to be up to date. I would steer well clear of poor quality or out of date questions.

I'd suggest testing yourself repeatedly throughout your journey, don't wait until you're getting close to exam time. Practice questions should be considered both a learning tool and an evaluation tool and should therefore be included in your training plan from early on.

The Digital Cloud Training Practice Exams courses usually include 390 questions for each exam. They are written in clear English and match the format, style and difficulty of the real AWS exam. We also included detailed explanations for both correct and incorrect answers so you can better understand the rationale behind each response.

Step 5 - Taking the Exam

After completing steps 1 - 4, and when you're regularly passing your practice exams with a high score, it's time to book your exam. You can book your exam using the AWS.training portal and depending on the exam you can either take your exam from your home or office with online proctoring or attend a testing center.

Make sure that on exam day you're well rested and try and schedule the exam for a time in the day when your brain is going to be fresh and full of energy. Time management is critical so I often mark tricky questions for review, make my best guess, and then move on. You should aim to have some time at the end to review those tricky questions.

The key to having a good experience on exam day is to ensure you prepare adequately. Never rush to take the exam and only book when you're sure you've put in enough effort and are confident you're ready to pass.

Conclusion

The cloud computing industry is currently experiencing massive growth and this is likely to continue into the foreseeable future. The significant business and economic benefits that can be achieved by companies, especially in a post COVID-19 world, are likely to drive an increasing take up of cloud services.

> *There are significant job opportunities for aspiring cloud professionals and excellent career paths available. Working in this industry can be rewarding in many ways including good working conditions, exposure to interesting technologies, and generous wages.*

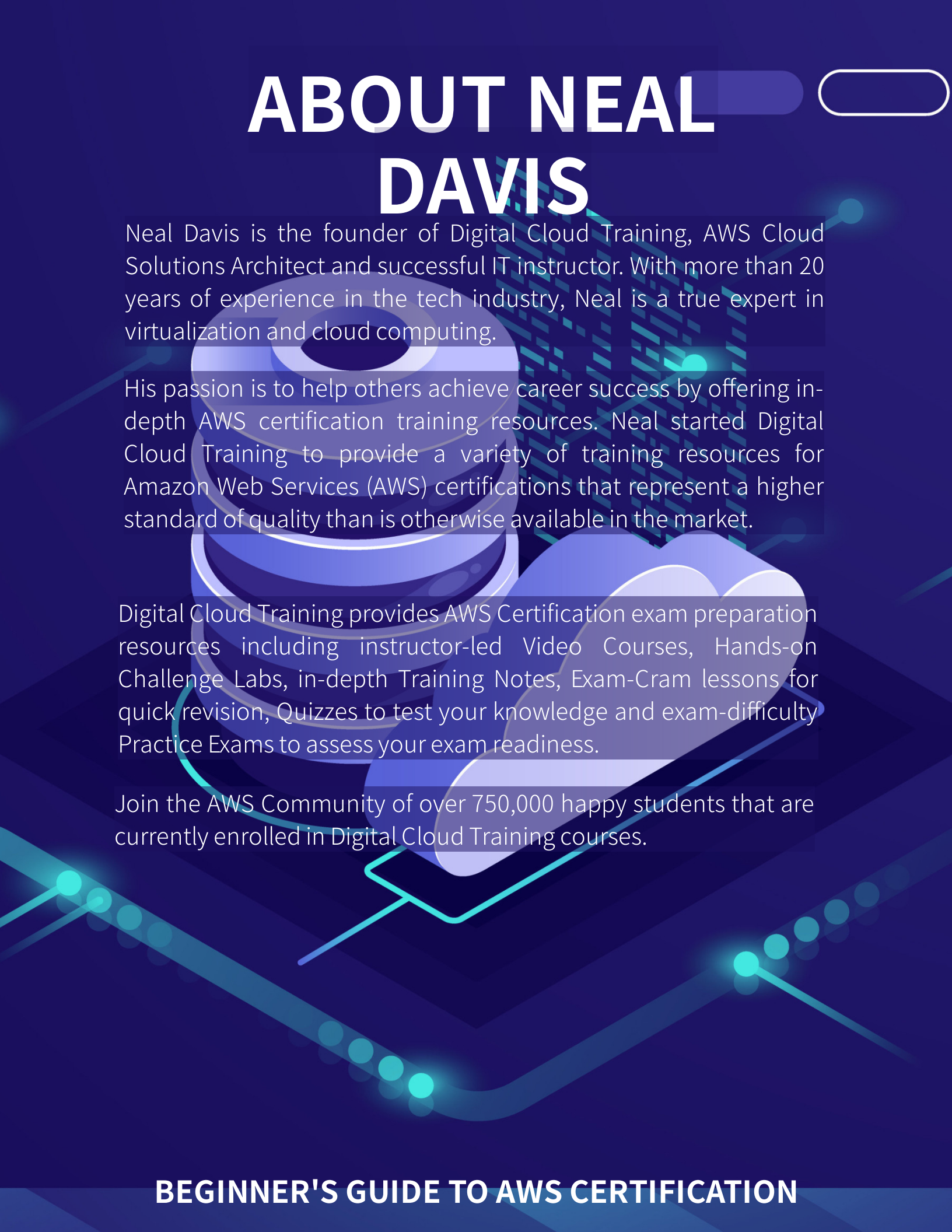
If you're ready to take action and start your exciting career in cloud computing, the best way to get started is to enroll in our AWS training course and start working towards your first AWS certification. This is where Digital Cloud Training can help you on your journey towards a rewarding career in cloud computing.

You'll need both practical expertise and theoretical knowledge and our video-based training courses include lots of hands-on exercises as well as theory lessons. You'll also need to learn how to answer difficult questions on the exam and our practice exam courses will help ensure you pass your exam first time.

ABOUT NEAL DAVIS

Neal Davis is the founder of Digital Cloud Training, AWS Cloud Solutions Architect and successful IT instructor. With more than 20 years of experience in the tech industry, Neal is a true expert in virtualization and cloud computing.

His passion is to help others achieve career success by offering in-depth AWS certification training resources. Neal started Digital Cloud Training to provide a variety of training resources for Amazon Web Services (AWS) certifications that represent a higher standard of quality than is otherwise available in the market.



Digital Cloud Training provides AWS Certification exam preparation resources including instructor-led Video Courses, Hands-on Challenge Labs, in-depth Training Notes, Exam-Cram lessons for quick revision, Quizzes to test your knowledge and exam-difficulty Practice Exams to assess your exam readiness.

Join the AWS Community of over 750,000 happy students that are currently enrolled in Digital Cloud Training courses.