

HPE Digital Learner AWS Certified Developer (Intermediate) Content Pack

HPE Content Pack number	CP018
Content Pack length	20 Hours
Content Pack category	Category 2
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This self-paced eLearning Content Pack will assist in the transition from a traditional IT applications developer role to a cloud application developer role. The course focuses on the skills needed to develop and deploy cloud-ready applications within the AWS public cloud. This is a comprehensive intermediate training series that is focused on the AWS Certified Developer (Associate) training path. It also supports the additional training needed to develop and deploy cloud-ready applications within a hybrid cloud landscape that includes utilizing the AWS public cloud architecture.

Audience

- Individuals and organizations seeking to gain insight into the benefits of Amazon Web Services
- IT professionals and developers who have devops - development and operations - experience including deploying, managing and operating the AWS platform
- Personnel at all levels of an enterprise who perform a developer role

Content Pack objectives

This Content Pack provides the information necessary to help transition a typical traditional IT applications developer into a cloud application developer capable of developing and deploying applications within the AWS public cloud architecture. This training series focuses on the “AWS Certified Developer (Associate)” certification path and provides other relevant training needed for successful development

and deployment of cloud-ready applications within the AWS public cloud domain. The training included for the AWS Certified Developer (Associate) path includes AWS principals and essential services, AWS application planning and development, infrastructure, security, service integration and orchestration, serverless applications, container management, code management and monitoring tools. Other relevant training includes AWS source control, deployment and delivery, ECS and OpsWorks, and code deployment as well as other baseline introductory training (getting started with AWS, core AWS services and AWS infrastructure services). This training will enable the student to transition to the cloud application developer role working within a typical AWS public cloud environment and will also assist with the path to AWS Certification.

Detailed Content Pack outline

Cloud Tech Primer

In this course, standard IT technologies will be mapped to cloud equivalents in the AWS environment.

- Describe common network functionality also available in the cloud
- Describe common database functionality also available in the cloud
- Describe the role of a hypervisor
- Compare and contrast on-premises and cloud virtual machines
- Define what a container service does
- List standard development practices and protocols also available in the cloud
- Recognize managed services in the cloud
- Specify when HPC should be used
- Identify variations in how cloud services can be deployed to meet needs
- Describe cloud components

The AWS Cloud

This course covers cloud computing concepts and also defines AWS services that can solve specific business problems.

- Describe what enterprise cloud computing is
- Define the characteristics of a public cloud
- Define the characteristics of a private cloud
- Define the characteristics of a hybrid cloud
- Explain how IaaS maps to IT services
- Explain how PaaS maps to IT services
- Explain how SaaS maps to IT services
- Describe how cloud computing can benefit businesses
- Describe a service level agreement
- List major cloud providers and how their services vary
- Show which AWS services can solve specific business problems
- Sign up for AWS
- Define cloud models and SLA details

AWS Certified Developer - Associate: Principles and Essential Services

In this course, you will explore the core AWS architecture, services, tools and their utilization to implement application development and deployment in Amazon Web Services

- Recognize the technical benefits of cloud computing
- List the important design principles that need to be applied while architecting on the cloud
- Identify the essential components of Amazon Web Services along with the various services offered by those components
- Describe the various ways and approaches of interacting with the cloud
- Create EC2 instances and describe the security group configuration options
- Demonstrate how to implement auto scaling groups in Amazon Web Services
- Describe how to facilitate serverless setup and how it is used with Lambda
- Recognize the various types of storage that are available in Amazon Web Services and the patterns of using them effectively
- Configure and work with S3, EBS and Glacier
- Specify the various approaches of content delivery in Amazon Web Services
- Work with content delivery using Amazon CloudFront
- Specify the various implementations of database services in Amazon Web Services
- Create and configure the RDS service to be utilized as a database for applications
- Configure and use DynamoDB with applications
- Describe the various cloud management tools and the scenarios of utilizing those tools
- Work with CloudFormation templates in Amazon Web Services
- Build and deploy applications using Amazon Beanstalk
- Recognize how SNS and SWS is used in Amazon Web Services
- Identify the concept of cloud networking in Amazon Web Services and how to set up subnets and IP ranges
- Implement VPC and subnets in Amazon Web Services to deploy applications

AWS Certified Developer - Associate: Application Development

In this course, you will discover the development lifecycle phases that are implemented in AWS to build, deploy and test applications. You will also explore various development approaches including serverless and microservices.

- Set up AWS SDK for application development
- Recognize the programmatic approach of interacting with various AWS services
- Integrate applications with Amazon S3 and DynamoDB to facilitate application data management
- List the various approaches of integrating applications using SNS and other AWS services
- Configure AWS IAM to authenticate services
- Set up and work with ElastiCache in the cloud application architecture
- Demonstrate the application deployment capabilities provided by CloudFormation
- List the various phases of application development on the cloud
- Set up a source code repository for application development on Amazon Web Services
- Set up the application development environment for Amazon Web Services
- Recognize the various activities and services that are involved during the build phase
- Specify the test phases and the various types of testing that are implemented for application development on the cloud
- Recognize the capabilities, benefits and usage scenarios of Lambda
- Demonstrate how to facilitate serverless architecture setup and development using Lambda
- Specify the principles of microservice and its implementation on the cloud
- Demonstrate the end-to-end implementation of Continuous Integration and Continuous Deployment on AWS using DevWorks services

AWS Certified Developer - Associate: Plan Application and Infrastructure Security

In this course, you will explore AWS security best practices for various AWS services and examine backup strategies that are implemented in AWS for availability and failover.

- Describe the AWS principle of shared security responsibility and the responsibility of cloud providers and users
- Describe AWS security architecture, including components and their roles, and compliance and regulations
- Describe the features of the CIA and AA security models and how they are implemented in AWS
- Identify the need for network security and the approaches of securing networks in AWS
- Recognize the critical security vulnerabilities and the solutions provided by AWS
- Configure AWS account security, including groups, users and roles using IAM
- Describe instance security types and the storage services in AWS
- Demonstrate how to secure instances and implement secure auto scaling groups
- Recognize how to secure S3
- Identify the need for application service security and approaches for securing application services
- Demonstrate how to secure various AWS services like SQS, SNS and SWF
- Describe the various approaches and features provided by AWS to secure infrastructures
- Recognize the various backup and archiving strategies and capabilities provide by Cloud Native
- Demonstrate how to provision snapshots and hot backups in AWS
- Set up and work with multi-volume backup
- Demonstrate the backup tasks required to back up RDS and AMI

AWS Certified Developer - Associate: Service Integration and Orchestration

In this course, you will discover important services that must be integrated into applications to facilitate persistence management, messaging and middleware capabilities. You will also examine the use of CloudFormation to orchestrate services.

- Demonstrate how to deploy web applications in Beanstalk
- Illustrate how to integrate DynamoDB with applications
- Create tables with items and attributes and apply CRUD operations on the tables
- Recognize the various objects of DynamoDB including indexes, streams, and queries
- Create SNS topics and integrate them with applications
- Recognize best practices for working with DynamoDB and SNS
- Describe the various approaches and tasks that are involved when migrating applications to the cloud
- Recognize the essential concepts of CloudFormation including the use of templates, stacks and sets
- Demonstrate the steps required for creating and monitoring the progress of stack creation
- Identify the best practices that we can adopt when working with CloudFormation to orchestrate services
- Illustrate how to create, manage and secure SQS queues
- Describe best practices for working with SQS and SNS services
- Identify the benefits of implementing CloudTrail and the typical workflow of using it in the AWS architecture
- Demonstrate how to use CloudWatch to monitor cloud resources and applications

AWS Certified Developer - Associate: Serverless Application and Container Management

In this course, you will discover serverless application development using Lambda and API gateway. You will also explore containerization using ECS and managing microservices in containers.

- Describe the features and benefits of the AWS serverless application model
- Create Lambda functions from scratch by using blueprint and the serverless application repository
- Identify how to use Lambda functions to access AWS services
- Specify the Lambda execution model to use in deployment scenarios
- Integrate Lambda functions with event source services like S3, Dynamo, Kinesis, SNS and CloudTrail
- Demonstrate how to invoke on-demand Lambda functions using Amazon API gateway
- Demonstrate how to invoke scheduled Lambda functions
- Identify the essential features of Elastic Container Service and its role in application deployment
- Demonstrate how to convert monolithic applications to microservices and deploy the microservices in containers
- Recognize how to provision Docker-enabled applications on an Amazon ECS cluster
- List the best practices for working with ECS and ECR
- Recognize how to create APIs in Amazon API Gateway
- Illustrate the different approaches of setting up Edge-optimized API using a console and REST API
- Create and configure an API to expose Amazon S3 and Kinesis
- Identify the limitations of API gateway

AWS Certified Developer - Associate: Code Management and Monitoring Tools

In this course, you will explore AWS code management using tools like CodeCommit, CodePipeline, CodeBuild and CodeDeploy.

- Identify the common issues and troubleshooting approaches implemented in AWS
- Work with CloudWatch to monitor application resources
- List the essential AWS log files and recognize typical file entries and their meaning
- Illustrate the capabilities of AWS X-Ray and AWS CodeStar
- List the various tools that are being used to manage code in AWS
- Work with AWS CodePipeline to implement continuous integration and continuous deployment

Source Control on AWS

Source control, the management of changes to an organization's code base, is very important for growing companies. In this course, you will learn to use the AWS product CodeCommit.

- Describe the data model in Git
- Describe the process of using Git for branching and merging
- Describe the process of using Git for merging and integrating
- Describe the protocols and etiquette to use when collaborating with Git (feature flags and test-driven development)
- Describe the various Git branches and how they relate to each other
- Configure an IAM user group policy and install Git and Bash in AWS CodeCommit
- Configure SSH for AWS CodeCommit
- Create a repo in AWS CodeCommit
- Integrate an AWS CodeCommit repo with a Lambda function
- Integrate an AWS CodeCommit repo with an SNS topic

Deployment and Delivery on AWS

Continuous delivery is a practice in which code changes are automatically built, tested and prepared for deployment. In this course, you will learn the basics of Docker and how to use Amazon Elastic Beanstalk.

- Perform basic Docker operations
 - Recognize how to build Dockerfiles automatically
 - Recognize how to build containers interactively
 - Perform container networking operations and link containers
 - Recognize the basic operations when working with Docker volumes
 - Perform operations to clean up the registry using Docker cleanup commands
 - Create multicontainer-based applications using Docker compose
 - Describe the features of Elastic Beanstalk
 - Recognize environment types, stages and promotion
 - Describe the process of setting up a local file system to GitLab
 - Configure a deployment pipeline on Elastic Beanstalk with GitLab using the Elastic Beanstalk CLI
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Amazon ECS and OpsWorks

Amazon Elastic Container Service (ECS) is a container management service that allows you to run applications on a managed cluster. OpsWorks lets you manage applications and servers. In this course, you will learn to use ECS and OpsWorks.

- Push and pull Docker containers to the Elastic Container Registry (ECR)
- Create a cluster on Amazon ECS
- Describe the properties of ECS container instances
- Describe the ECS task definition
- Create and run an ECS task definition
- Deploy multi-container applications with ECS clusters
- Configure an application load balancer for use with an Amazon ECS cluster
- Configure application load balancers to work in conjunction with auto scaling group of a cluster
- Examine an AWS OpsWorks sample stack
- Describe stacks, layers and auto healing within OpsWorks
- Describe the process of setting up instances for a layer within an OpsWorks stack
- Describe the process of creating an application within AWS OpsWorks and deploying to one or more EC2 instances

Using AWS CodeDeploy

AWS CodeDeploy allows you to automate code deployments. This makes it easier to rapidly release new features. In this course, you will learn how to use CodeDeploy.

- Describe AWS CodeDeploy and the deployment types
- Describe the process of setting up IAM for use with CodeDeploy
- Describe the process of launching EC2 instances for use with CodeDeploy
- Set up CodeDeploy applications and groups to work with EC2 instances
- Push source code to deploy an application
- Configure application and deployment groups
- Describe the Appspec file and lifecycle hooks one could use for an application
- Configure a deployment group to have an auto scaling group and a load balancer
- Set up a continuous delivery pipeline using GitLab
- Describe the options one has to monitor deployments

Getting Started with Amazon Web Services

Amazon Web Services is a cloud computing platform. It provides a comprehensive platform from which to provide web applications with high availability. AWS manages application-related resources automatically from convenient interfaces. In this course, you will learn some of the various services offered by Amazon Web Services. You will also learn the basic steps to start developing a Node.js application on AWS.

- Identify the features and benefits of cloud computing
- Describe the features of Amazon S3
- Describe the features of Amazon Compute services
- Use Amazon event services in your application
- Administer AWS users and accounts
- Identify Amazon database services
- Describe Amazon services to help with task automation
- Describe the features of the AWS Management Console
- Make use of AWS documentation
- Install Node.js and the Node Package Manager in AWS
- Prepare your environment to use the AWS SDK
- Install Express.js in your environment
- Make use of the JSON data description language
- Describe the file structure of an Express.js application
- Describe AWS user accounts and group permissions
- Describe AWS account credentials and security features
- Identify AWS access control mechanisms
- Utilize access credentials from other services
- Describe IAM roles as they relate to EC2
- Create S3 buckets for data storage
- Track object versions and replicate objects across regions
- Perform operations on S3 buckets and the objects in it
- Configure CloudFront to distribute media streams efficiently
- Use CloudFront to distribute media streams efficiently
- Use CloudWatch and CloudTrail to monitor your AWS instances
- Host a web site on Amazon S3
- Provide user access to an Amazon S3 bucket

Core Services on AWS

AWS provides multiple services that address all needs of an online application. It provides a comprehensive platform from which to provide web applications with high availability. In this course, you will learn about services and features to enable you to host your service with confidence.

- Describe the features of the standard AWS VPC
- Create an AWS Virtual Private Cloud and define its network
- Control access to your services
- Securing your network services
- Create and configure a VPC
- Launch an EC2 instance from an AMI
- Make use of Amazon EBS for storage and create snapshots
- Distribute application requests across multiple instances
- Scale server numbers to meet application load
- Manage the configuration of your application
- Describe DynamoDB table structure
- Identify indexes on DynamoDB tables
- Select the level of data consistency when accessing records
- Set required throughput on a table
- Design and work with DynamoDB tables effectively
- Read, write and modify data contained in a DynamoDB table
- Monitor AWS log files
- Monitor AWS API calls
- Get notifications and take actions based on S3 events
- Take actions and receive notifications based on DynamoDB events
- Execute pieces of code in response to AWS events
- Publish and monitor your application API
- Use AWS Lambda to execute code on demand

AWS Infrastructure Services

Amazon Web Services consists of a number of services designed to ensure your customers are always able to access your services. Preventing downtime and ensuring enough servers are available during times of peak load are situations that are handled through the AWS infrastructure. In this course, you will learn about AWS security and elastic services designed to host your application and guarantee high availability.

- Set up a domain in Route 53
- Ensure your customers know you are working to recover in the event of a major problem
- Route traffic to your application in an optimized way
- Route traffic to your application based on predefined weights
- Configure Amazon WorkMail with Route 53
- Describe features of Amazon IoT Device Registry
- Define Things in Amazon IoT and attach certificates
- Configure Amazon IoT policies and permissions
- Describe Amazon IoT topics
- Configure rules in the Amazon IoT service
- Use Amazon SNS in your project
- Use Amazon SQS with your project
- Use Amazon SWF in your project
- Describe the features of Docker containers
- Install and configure Docker on your local workstation
- Perform common Docker commands
- Create a CloudFormation stack
- Perform the steps to run a stack
- Work with the CloudFormation stack details page
- Describe the CloudFormation template structure
- Deploy an application on Amazon Elastic Beanstalk
- Describe the features of the Amazon shared responsibility model
- Deploy a sample application on Amazon Elastic Beanstalk

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