Course Introduction

AWS Academy Cloud Foundations

Who I am :)

Academy

- PhD in Cloud Computing
- Researcher at University of Stuttgart
- Polytechnic University in Madrid

Industry

- Cloud Architect at Volkswagen Financial Services
- Principal Cloud Architect at Volkswagen Group

Some extra stuff

- Love Cloud Architectures
- Learn, learn, and learn
- Tennis & Sailing

Background check

Background Check

Class Rules

- On-site in campus (online is an exception)
- Be punctual
- Open and direct
- There are no stupid questions
- Feedback is always welcome
- No laptops unless necessary

Section 1: Course objectives and overview

Course Introduction

Course prerequisites

- General Required Knowledge
  - IT technical knowledge (concepts & programming)
  - IT business knowledge (little)
- Preferred Knowledge
  - Familiarity with cloud computing concepts
  - Working knowledge of distributed systems
  - Familiarity with general networking concepts
  - Working knowledge of multi-tier architectures

Course objectives

After completing this course, you should be able to:

- Define the AWS Cloud.
- Explain the AWS pricing philosophy.
- Identify the global infrastructure components of AWS.
- Describe security and compliance measures of the AWS Cloud including AWS Identity and Access Management (IAM).
- Create an AWS Virtual Private Cloud (Amazon VPC).
- Decide when to use Amazon Elastic Compute Cloud (EC2), AWS Lambda and AWS Elastic Beanstalk.
- Differentiate between Amazon S3, Amazon EBS, Amazon EFS and Amazon S3 Glacier.
- Demonstrate when to use AWS Database services including Amazon Relational Database Service (RDS), Amazon DynamoDB, Amazon Redshift, and Amazon Aurora.
- Explain AWS Cloud architectural principles.
- Explore key concepts related to Elastic Load Balancing (ELB), Amazon CloudWatch, and Auto Scaling.
- Deploy sample realistic workloads in our Labs

Course outline

- Module 1: Cloud Concepts Overview
- Module 2: Cloud Economics and Billing
- Module 3: AWS Global Infrastructure Overview
- Module 4: AWS Cloud Security
- Module 5: Networking and Content Delivery
- Module 6: Storage
- Module 7: Compute
- Module 8: Databases
- Module 9: Cloud Architecture
- Module 10: Automatic Scaling and Monitoring
- Incremental Project throughout the course

Module 1: Cloud Concepts Overview

Module sections:

- Introduction to cloud computing
- Advantages of cloud computing
- Introduction to Amazon Web Services (AWS)
- Moving to the AWS Cloud – The AWS Cloud Adoption Framework (AWS CAF)

Module 2: Cloud Economics and Billing

Module sections:

- Fundamentals of pricing
- Total Cost of Ownership
- AWS Organizations
- AWS Billing and Cost Management
- Technical support

Module 3: AWS Global Infrastructure Overview

Module sections:

- AWS Global Infrastructure
- AWS services and service category overview

Module 4: AWS Cloud Security

Module sections:

- AWS shared responsibility model
- AWS Identity and Access Management (IAM)
- Securing a new AWS account
- Securing accounts
- Securing data on AWS
- Working to ensure compliance

Module 5: Networking and Content Delivery

Module sections:

- Networking basics
- Amazon VPC
- VPC networking
- VPC security
- Amazon Route 53
- Amazon CloudFront

Module 6: Storage

Module sections:

- Amazon Elastic Block Store (Amazon EBS)
- Amazon Simple Storage Service (Amazon S3)
- Amazon Elastic File System (Amazon EFS)
- Amazon Simple Storage Service Glacier

Module 7: Compute

Module sections:

- Compute services overview
- Amazon EC2
- Amazon EC2 cost optimization
- Container services
- Introduction to AWS Lambda
- Introduction to AWS Elastic Beanstalk

Module 8: Databases

Module sections:

- Amazon Relational Database Service (Amazon RDS)
- Amazon DynamoDB
- Amazon Redshift
- Amazon Aurora

Module 9: Cloud Architecture

Module sections:

- AWS Well-Architected Framework
- Reliability and availability
- AWS Trusted Advisor

Module 10: Automatic Scaling and Monitoring

Module sections:

- Elastic Load Balancing
- Amazon CloudWatch
- Amazon EC2 Auto Scaling

Grading

50 % Weekly Quizzes

50 % Projects

Weekly Quizzes

- Mandatory for each module
- 1 week to complete
- Quiz in MS teams in the lecture channel
- Grading is %
- Multiple choice or multiple choices

Projects (group of 3-4)

- Project 1 - Serverless Website using Content Delivery Network (25 %)
- Project 2 - Server Website using scalability and databases (25 %)
- Bonus Project - Infrastructure as code (30 extra grade points)
- **Presentation of projects 30.6 - 11.7**

Groups to be submitted via MS Teams to me until 14.4 !!!

- **name of participants**
- **email addresses**

Working Model

1. All important announcements in MS Teams Channel
2. Assistance to face-to-face classes is mandatory
3. Be punctual
4. If you are sick, please join online
5. I’m reachable in Teams if you have questions outside of the lectures
6. Enjoy and have fun :)
7. Feedback is always welcome :)

Section 3: AWS Documentation

Course Introduction

AWS Documentation

- Find user guides, developer guides, API references, tutorials, and more at https://docs.aws.amazon.com/

- ***Whitepapers*** are also available at https://aws.amazon.com/whitepapers/, including these which are recommended reading for the AWS Cloud Practitioner exam:
  - Overview of Amazon Web Services: https://d0.awsstatic.com/whitepapers/aws-overview.pdf
  - Architecting for the Cloud: AWS Best Practices: https://d1.awsstatic.com/whitepapers/AWS_Cloud_Best_Practices.pdf
  - How AWS Pricing Works: https://d0.awsstatic.com/whitepapers/aws_pricing_overview.pdf
  - The Total Cost of (Non) Ownership of Web Applications in the Cloud: https://media.amazonwebservices.com/AWS_TCO_Web_Applications.pdf

Activity - AWS Documentation Scavenger Hunt

- Navigate the AWS Documentation website
- Start from the main page at https://docs.aws.amazon.com
- Five challenge questions for the class appear in the following slides

AWS Documentation Scavenger Hunt – Question 1

- Question #2: Can you find the documentation that describes how to create an Amazon S3 bucket?

AWS Documentation Scavenger Hunt – Question 2 Answer

- Question #2: Can you find the documentation that describes how to create an Amazon S3 bucket?

- Answer https://docs.aws.amazon.com/AmazonS3/latest/gsg/CreatingABucket.html:
  - From https://docs.aws.amazon.com/ click **S3**
  - Click the **Getting Started Guide**
  - Click **Create a Bucket**

AWS Documentation Scavenger Hunt – Question 3

- Question #3: Can you find a one-sentence summary of the AWS Cloud9 service?

AWS Documentation Scavenger Hunt – Question 3 Answer

- Question #3: Can you find a one-sentence summary of the AWS Cloud9 service?

- Answer https://docs.aws.amazon.com/cloud9/?id=docs_gateway:
  - AWS Cloud9 is a cloud-based integrated development environment (IDE) that you use to write, run, and debug code.

AWS Documentation Scavenger Hunt – Question 4

- Question #4: Which programming languages does the AWS Lambda service API support?

AWS Documentation Scavenger Hunt – Question 4 Answer

- Question #4: Which programming languages does the AWS Lambda service API support?

- Answer https://docs.aws.amazon.com/lambda/latest/dg/gettingstarted-tools.html:
  - From the main AWS Documentation page, click the **AWS Lambda** link
  - Click the **API Reference** link
  - Click **Getting Started** > **Tools** to find a table that lists the following languages: **Node.js**, **Java**, **C#**, **Python**, **Ruby**, **Go**, and **PowerShell**

AWS Documentation Scavenger Hunt – Question 5

- Question #5: Find the tutorial that describes how to run a serverless Hello World application, then scroll through the documented steps. What two AWS services does the tutorial have you use?

AWS Documentation Scavenger Hunt – Question 5 Answer

- Question #5: Find the tutorial that describes how to run a serverless Hello World application, then scroll through the documented steps. What two AWS services does the tutorial have you use?

- Answer https://aws.amazon.com/getting-started/tutorials/run-serverless-code/:
  - From the main AWS Documentation page, click **Tutorials and Projects**
  - In the **Websites & Web Apps** area, click the tutorial.
  - The tutorial has you use **AWS Lambda** and **Amazon CloudWatch**.

Module wrap-up

Course Introduction

Module summary

In summary, in this module, you learned how to:

- Course setup and structure
- Navigate the AWS Documentation website

Additional resources

- AWS Certification: https://aws.amazon.com/certification/
- AWS Certified Cloud Practitioner: https://aws.amazon.com/certification/certified-cloud-practitioner/
- AWS Documentation: https://docs.aws.amazon.com/