

CSCI 5902 Adv. Cloud Architecting
Fall 2023
Instructor: Dr. Lu Yang

Week 2 – Lecture 1
Module 1 - Welcome to AWS Academy Cloud Architecting
Sep 11, 2023

Housekeeping and Feedback

- Start recording
- Midterm date changed to Oct 27 in class
- Help me find out who the newly registered students are
- Certification voucher
- Reference of co-op or full-time jobs

AWS Academy Cloud Architecting

Module 1: Welcome to AWS Academy Cloud Architecting

Module overview



Sections

1. Course objectives and overview
2. Café business case introduction
3. Roles in cloud computing

Module objectives



At the end of this module, you should be able to:

- Identify course objectives
- Recognize the café business case
- Indicate the role of cloud career

Module 1: Welcome to AWS Academy Cloud Architecting

Section 1: Course objectives and overview

Course objectives



After completing this course, you should be able to:

- Make architectural decisions based on AWS architectural principles and best practices
- Use AWS services to make your infrastructure scalable, reliable, and highly available
- Use AWS managed services to enable greater flexibility and resiliency in an infrastructure
- Indicate how to increase the performance efficiency and reduce costs of infrastructures built on AWS
- Use the AWS Well-Architected Framework to improve architectures that use AWS solutions

Course outline



- Module 1 – Welcome to AWS Academy Cloud Architecting (this module)
- Module 2 – Introducing Cloud Architecting
- Module 3 – Adding a Storage Layer
- Module 4 – Adding a Compute Layer
- Module 5 – Adding a Database Layer
- Module 6 – Creating a Networking Environment
- Module 7 – Connecting Networks
- Module 8 – Securing User and Application Access
- Module 9 – Implementing Elasticity, High Availability, and Monitoring
- Module 10 – Building Decoupled Architectures
- Module 11 – Building Microservices and Serverless Architectures
- Module 12 – Planning for Disaster
- Module 13 – Caching Content

CDN

Module 2: Introducing Cloud Architecting



Module sections:

1. What is cloud architecting?
2. The Amazon Web Services (AWS)
Well-Architected Framework *6 pillars*
3. Best practices for building solutions on AWS
4. AWS global infrastructure



Module 3: Adding a Storage Layer



Module sections:

1. The simplest architecture
2. Using Amazon S3
3. Storing data in Amazon S3
4. Moving data to and from Amazon S3
5. Choosing Regions for your architecture

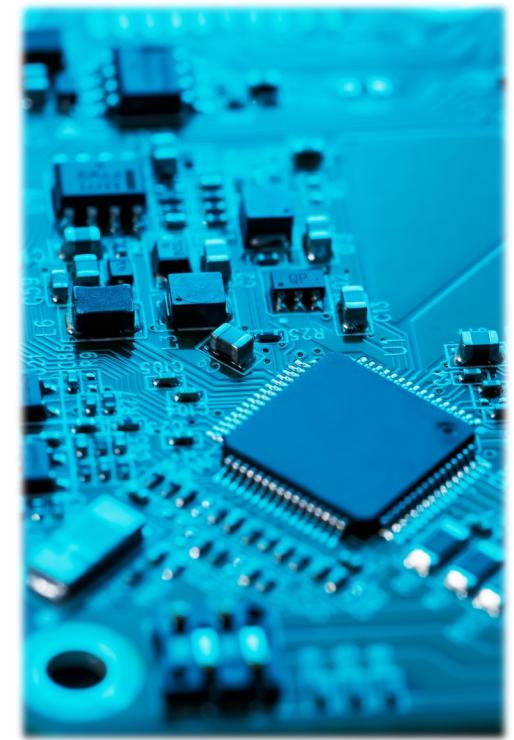


Module 4: Adding a Compute Layer



Module sections:

1. Architectural need
2. Adding compute with Amazon EC2
3. Choosing an Amazon Machine Image (AMI) to launch an Amazon Elastic Compute Cloud (Amazon EC2) instance
4. Selecting an Amazon EC2 instance type
5. Using user data to configure an Amazon EC2 instance
6. Adding storage to an Amazon EC2 instance
7. Amazon EC2 pricing options
8. Amazon EC2 considerations



Module 5: Adding a Database Layer



Module sections:

1. Architectural need
2. Database layer considerations
3. Amazon Relational Database Service (Amazon RDS)
4. Amazon DynamoDB
5. Database security controls
6. Migrating data into AWS databases

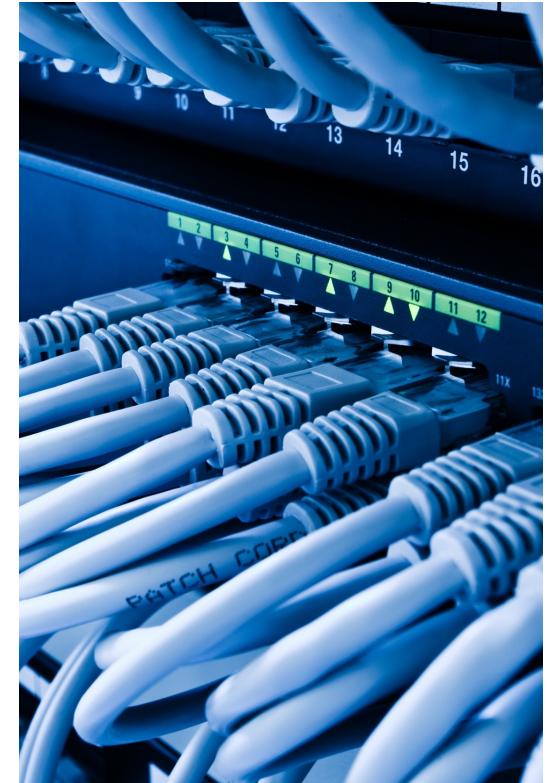


Module 6: Creating a Networking Environment



Module sections:

1. Architectural need
2. Creating an AWS networking environment
3. Connecting your AWS networking environment to the internet
4. Securing your AWS networking environment

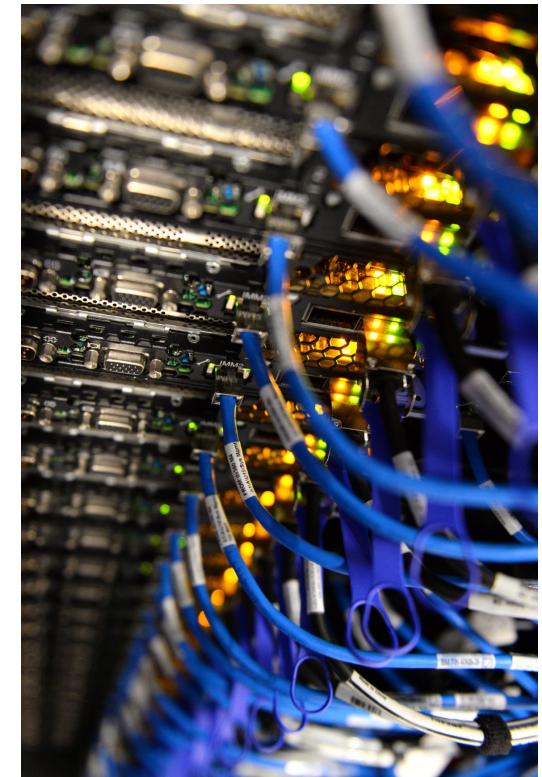


Module 7: Connecting Networks



Module sections:

1. Architectural need
2. Connecting to your remote network with AWS Site-to-Site VPN
3. Connecting to your remote network with AWS Direct Connect
4. Connecting virtual private clouds (VPCs) in AWS with VPC peering
5. Scaling your VPC network with AWS Transit Gateway
6. Connecting your VPC to supported AWS services



Module 8: Securing User and Application Access



Module sections:

1. Architectural need
2. Account users and AWS Identity and Access Management (**IAM**)
3. Organizing users
4. Federating users
5. Multiple accounts



Module 9: Implementing Elasticity, High Availability, and Monitoring



Module sections:

1. Architectural need
2. Scaling your compute resources
3. Scaling your databases
4. Designing an environment that's highly available
5. Monitoring

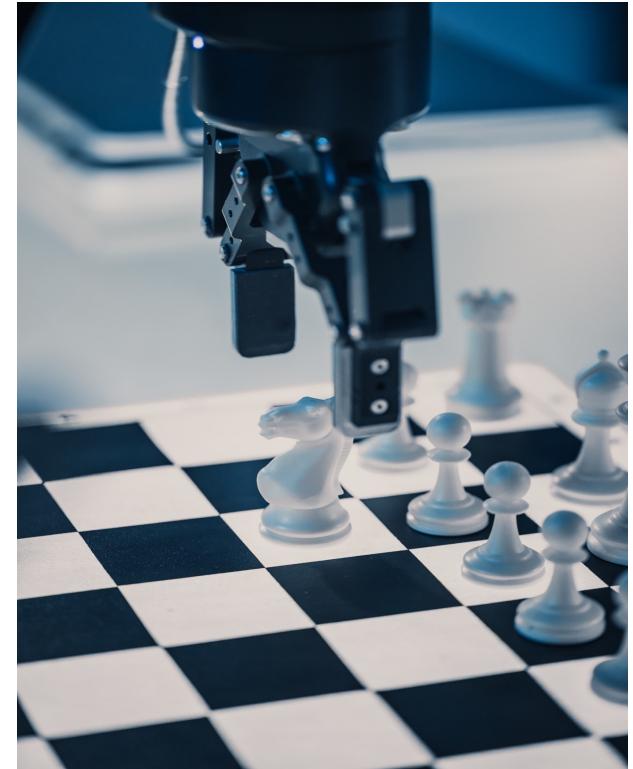


Module 10: Building Decoupled Architectures



Module sections:

1. Architectural need
2. Decoupling your architecture
3. Decoupling with Amazon Simple Queue Service
(Amazon SQS)
4. Decoupling with Amazon Simple Notification Service
(Amazon SNS)
5. Sending messages between cloud applications
and on-premises with Amazon MQ



Module 11: Building Microservices and Serverless Architectures



Module sections:

1. Architectural need
2. Introducing microservices
3. Building microservice applications with AWS container services
4. Introducing serverless architectures
5. Building serverless architectures with AWS Lambda
6. Extending serverless architectures with Amazon API Gateway
7. Orchestrating microservices with AWS Step Functions



Module 12: Planning for Disaster



Module sections:

1. Architectural need
2. Disaster planning strategies
3. Disaster recovery patterns



Module 13: Caching Content



Module sections:

1. Architectural need
2. Overview of caching
3. Edge caching
4. Caching web sessions
5. Caching databases

CDN



Module 1: Welcome to AWS Academy Cloud Architecting

Section 2: Café business case introduction

Café and bakery



The café owners and staff



Frank

- Co-owner of café
- Retired from Navy
- Likes to bake
- Non-technical



Martha

- Co-owner of café
- Retired accountant
- Knows how to use spreadsheets, otherwise non-technical



Sofía

- Daughter of Frank and Martha
- Manages the café's supply chain
- Technical skills, including programming, future business administration student
- Started to use AWS



Nikhil

- Café employee, visual design skills
- Interested in learning cloud computing
- Might take on more responsibilities at the café when Sofía starts her studies at the university



AWS consultants, café visitors



Olivia

- An AWS solutions architect
- Technical, with a specialty in databases and network technologies



Faythe

- Developer, experienced with AWS programming interfaces
- Knowledgeable about cloud security



Mateo

- Systems administrator and engineer
- Likes to find ways to automate and to create repeatable solutions
- Knows the importance of backups and disaster recovery in solution design



You will build solutions for the café in the challenge labs in this course



The café has business needs that can be solved with cloud computing architectures.



The café employees and the consultants often socialize and share cloud architecture ideas.

Module 1: Welcome to AWS Academy Cloud Architecting

Section 3: Roles in cloud computing

Roles in computing: IT professional



IT professional

- Generalist, might manage an application
- Often manages a production environment
- Highly technical
- Might have significant or limited experience in cloud technologies
- Might specialize in one area (such as security or storage)

Job titles: IT Administrator, Systems Administrator, Network Administrator

Roles in computing: IT leader



IT leader

- Leads a team of IT professionals
- Responsible for day-to-day operations
- Manages a budget, stays informed about and chooses new technologies
- Hands on during early stages of a project, then delegates the team to take over

Job titles: IT Manager, IT Director, IT Supervisor

Roles in computing: Developer



Developer

- Writes, tests, and fixes code
- Thinks about projects at the application level
- Likes sample code
- Works with APIs, SDKs

Job titles: Software Developer, System Architect, Software Development Manager

Roles in computing: DevOps engineer



DevOps engineer

- Builds out the infrastructure that applications run on, often in the cloud
- Follow the guidelines of the cloud architect
- Prefer experimenting and trying things out rather than lots of reading

Job titles: DevOps Engineer, Reliability Engineer, Build Engineer

Roles in computing: Cloud architect



Cloud architect

- Stays up-to-date with new technologies, helps decide which to use
- Provides documentation, processes, and tooling to developers
- Gives developers freedom to innovate
- Common challenges include –
 - Resource management
 - Cost optimization
 - Defining best practices for performance, reliability, and security

Job titles: Cloud Architect, Systems Engineer, Systems Analyst

AWS Certification exams



This course helps prepare you for the AWS Certified Solutions Architect – Associate exam

Available AWS Certifications

Professional

Two years of comprehensive experience designing, operating, and troubleshooting solutions using the AWS Cloud



Associate

One year of experience solving problems and implementing solutions using the AWS Cloud



Foundational

Six months of fundamental AWS Cloud and industry knowledge

Cloud Practitioner



aws certified
Updated May 2019

Specialty

Technical AWS Cloud experience in the Specialty domain as specified in the exam guide



Module 1: Welcome to AWS Academy Cloud Architecting

Module wrap-up

Module summary



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

- Identify course prerequisites and objectives
- Recognize the café business case
- Indicate the role of cloud architects

Thank you and Kahoot time!

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