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Developing Serverless Solutions on AWS User Manual

CLOUD COMPUTING AND VIRTUALISATION
Developing Serverless
Solutions on AWS
3 days

Contents

Developing Serverless Solutions on AWS

AWS AT LUMIFY WORK

Lumify Work is an official AWS Training Partner for Australia, New Zealand, and the Philippines. Through our Authorised AWS Instructors, we can provide you with a learning path that's relevant to you and your organisation, so you can get more out of the cloud. We offer virtual and face-to-face classroom-based training to help you build your cloud skills and enable you to achieve industry-recognised AWS Certification.

WHY STUDY THIS COURSE

This course gives developers exposure to and practice with best practices for building serverless applications using AWS Lambda and other services in the AWS serverless platform. You will use AWS frameworks to deploy a serverless application in hands-on labs that progress from simpler to more complex topics. You will use AWS documentation throughout the course to develop authentic methods for learning and problem-solving beyond the classroom.

This course includes presentations, hands-on labs, demonstrations, videos, knowledge checks, and group exercises.

WHAT YOU'LL LEARN

This course is designed to teach participants how to:

- Apply event-driven best practices to a serverless application design using appropriate AWS services
- Identify the challenges and trade-offs of transitioning to serverless development, and make recommendations that suit your development organisation and environment
- Build serverless applications using patterns that connect AWS managed services together, and account for service characteristics, including service quotas, available integrations, invocation model, error handling, and event source payload
- Compare and contrast available options for writing infrastructure as code, including AWS CloudFormation, AWS Amplify, AWS Serverless Application Model (AWS SAM), and AWS Cloud Development Kit (AWS CDK)
- Apply best practices to writing Lambda functions inclusive of error handling, logging, environment re-use, using layers, statelessness, idempotency, and configuring concurrency and memory
- Apply best practices for building observability and monitoring into your serverless application
- Apply security best practices to serverless applications
- Identify key scaling considerations in a serverless application, and match each consideration to the methods, tools, or best practices to manage it
- Use AWS SAM, AWS CDK, and AWS developer tools to configure a CI/CD workflow, and automate deployment of a serverless application
- Create and actively maintain a list of serverless resources that will assist in your ongoing serverless development and engagement with the serverless community

My instructor was great being able to put scenarios into real world instances that related to my specific situation
I was made to feel welcome from the moment I arrived and the ability to sit as a group outside the classroom to discuss our situations and our goals was extremely valuable.
I learnt a lot and felt it was important that my goals by attending this course were met.
Great job Lumify Work team.

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Lumify Work Customised Training
We can also deliver and customise this training course for larger groups saving your organisation time, money and resources.
For more information, please contact us on 02 8286 9429.

COURSE SUBJECTS

Module 0: Int roduct ion

- Introduction to the application you will build
- Access to course resources (Student Guide, Lab Guide, and Online Course Supplement)

Module 1: Thinking Serverless

- Best practices for building modern serverless applications
- Event-driven design
- AWS services that support event-driven serverless applications

Module 2: API-Driven Development and Synchronous Event Sources

- Characteristics of standard request /response API-based web applications
- How Amazon API Gateway fits into serverless applications
- Try-it-out exercise: Set up an HT T P API endpoint integrated with a Lambda function
- High-level comparison of API types (REST /HT T P, WebSocket, Graphlet)

Module 3 : Int reduction to Auth henicid ion, Auth heroization, and Access Control

- Authentication vs. Authorisation
- Options for authenticating to APIs using API Gateway
- Amazon Cognito in serverless applications
- Amazon Cognito user pools vs. federated identities

Module 4: Serverless Deployment Frameworks

- Overview of imperative vs. declarative programming for infrastructure as code
- Comparison of CloudFormation, AWS CDK, Amplify, and AWS SAM frameworks
- Features of AWS SAM and the AWS SAM CLI for local emulation and testing

Module 5: Using Amazon Event Bridge and Amazon SNS t o Decouple Component s

- Development considerations when using asynchronous event sources
- Features and use cases of Amazon EventBridge
- Try-it-out exercise: Build a custom EventBridge bus and rule
- Comparison of use cases for Amazon Simple Notification Service (Amazon SNS) vs.
  EventBridge
- Try-it-out exercise: Configure an Amazon SNS topic with filtering

Module 6: Event -Driven Development Using Queues and St reams

- Development considerations when using polling event sources to trigger Lambda functions

- Distinctions between queues and streams as event sources for Lambda
- Selecting appropriate configurations when using Amazon Simple Queue Service (AmazonSQS) or Amazon Kinesis Data Streams as an event source for Lambda
- Try-it-out exercise: Configure an Amazon SQS queue with a dead-letter queue as a Lambda event source

Hands-On Labs

- Hands-On Lab 1: Deploying a Simple Serverless Application
- Hands-On Lab 2: Message Fan-Out with Amazon EventBridge

Module 7: Writ ing Good Lambda Funct ions

- How the Lambda lifecycle influences your function code
- Best practices for your Lambda functions
- Configuring a function
- Function code, versions and aliases
- Try-it-out exercise: Configure and test a Lambda function
- Lambda error handling
- Handling partial failures with queues and streams

Module 8: St ep Funct ions f or Orchest rat ion

- AWS Step Functions in serverless architectures
- Try-it-out exercise: Step Functions states
- T he callback pattern
- Standard vs. Express Workflows
- Step Functions direct integrations
- Try-it-out exercise: Troubleshooting a Standard Step Functions workflow

Module 9: Observability and Monitoring

- The three pillars of observability
- Amazon CloudWatch Logs and Logs Insights
- Writing effective log files
- Try-it-out exercise: Interpreting logs
- Using AWS X-Ray for observability
- Try-it-out exercise: Enable X-Ray and interpret X-Ray traces
- CloudWatch metrics and embedded metrics format
- Try-it-out exercise: Metrics and alarms
- Try-it-out exercise: ServiceLens

Hands-On Labs

- Hands-On Lab 3: Workflow Orchestration Using AWS Step Functions
- Hands-On Lab 4 : Observability and Monitoring

Module 10: Serverless Applicat ion Security

- Security best practices for serverless applications
- Applying security at all layers
- API Gateway and application security
- Lambda and application security
- Protecting data in your serverless data stores
- Auditing and traceability

Module 11: Handling Scale in Serverless Applications

- Scaling considerations for serverless applications
- Using API Gateway to manage scale
- Lambda concurrency scaling
- How different event sources scale with Lambda

Module 12: Automat ing t he Deployment Pipeline

- The importance of CI/CD in serverless applications
- Tools in a serverless pipeline
- AWS SAM features for serverless deployments
- Best practices for automation
- Course wrap-up

Hands-On Labs

- Hands-On Lab 5: Securing Serverless Applications
- Hands-On Lab 6: Serverless CI/CD on AWS

Please note: This is an emerging technology course. Course outline is subject to change as needed.

WHO IS THE COURSE FOR?

This course is intended for:

- Developers who have some familiarity with serverless and experience with development in the AWS Cloud

PREREQUISITES

We recommend that attendees of this course have:

- Familiarity with the basics of AWS Cloud architecture

- An understanding of developing applications on AWS equivalent to completing the **Developing on AWS** course
- Knowledge equivalent to completing the following serverless digital

  trainings: AWS Lambda Foundations and Amazon API Gateway for Serverless Applications

https://www.lumifywork.com/en-ph/courses/developing-serverless-solutions-on-aws/
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Documents / Resources

	AWS Developing Serverless Solutions on AWS [pdf] User Manual Developing Serverless Solutions on AWS, Serverless Solutions on AWS, Solutions on AWS

References

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- ✹ **Lumify Work | Lumify Work AU**
- ✹ **Developing on AWS | Lumify Work PH**
- ✹ **Developing Serverless Solutions on AWS | Lumify Work PH**
- **User Manual**