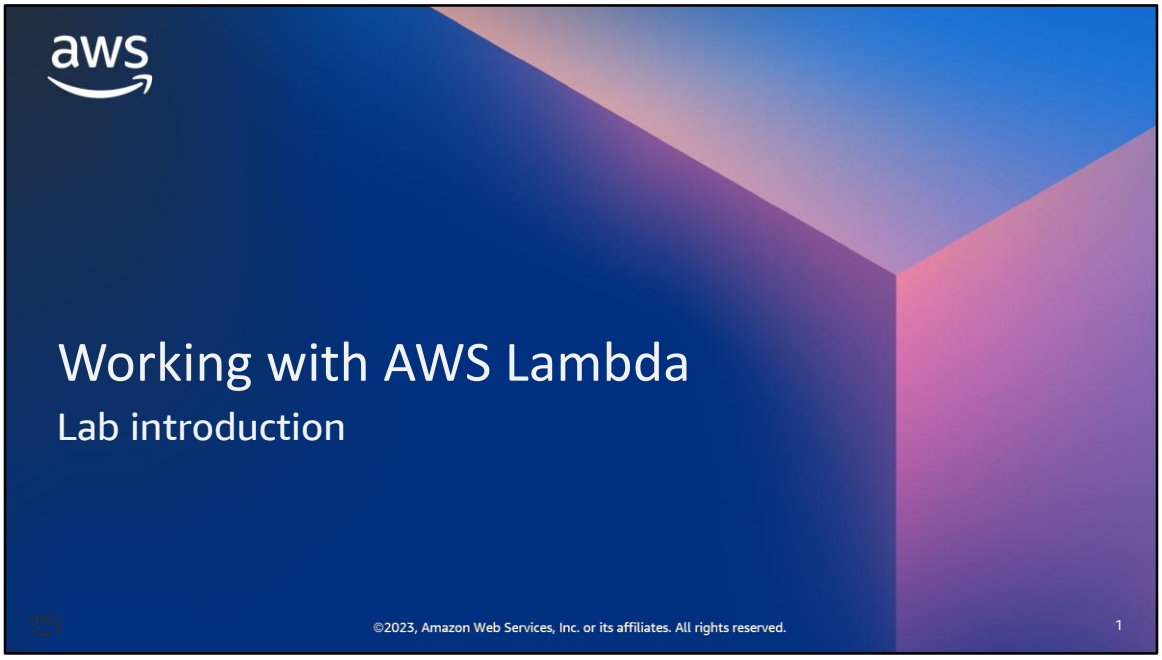
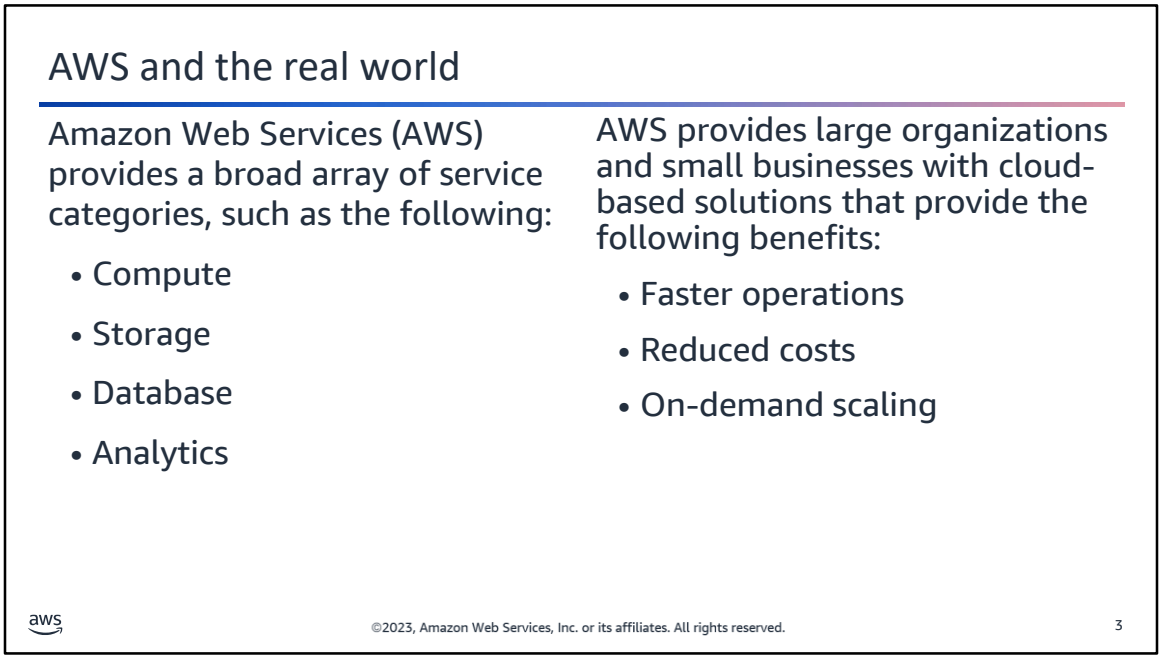


Working with AWS Lambda

Lab introduction



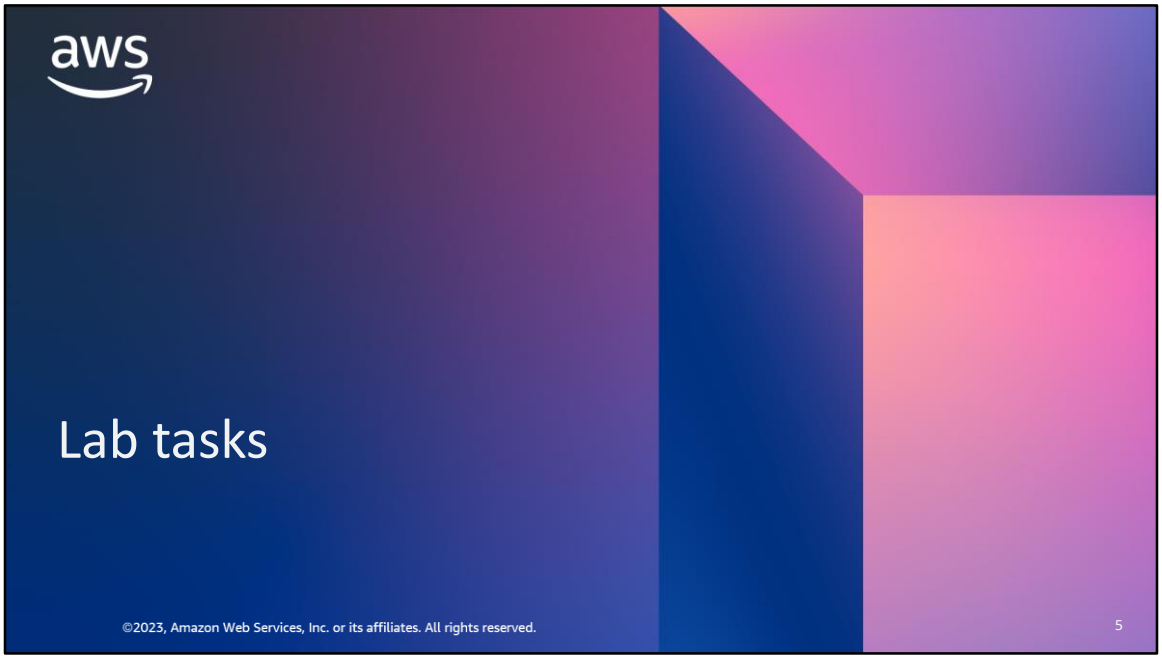
Amazon Web Services (AWS) offers a broad array of service categories—compute, storage, database, and analytics—that help large organizations and small businesses. These services provide businesses with the technology to move their operations forward faster, reduce costs, and scale based on demand.

Business need: Automated reporting

Sofía wants to send out a daily report to Frank and Martha. This report would list the café's daily baking needs.

The report would use previous orders to determine tomorrow's baking requirements.

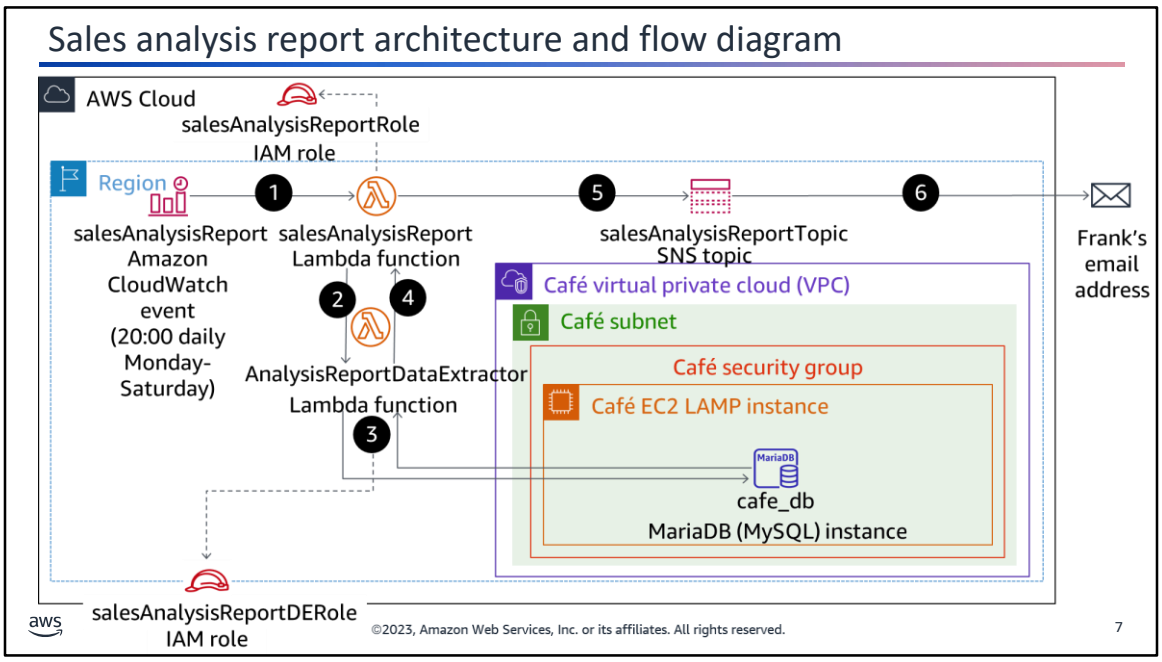
Sofía: Hello, Nikhil! We would like to send a daily report so that we can plan tomorrow's baking requirements based on today's sales.
Nikhil: You could send a daily report cost effectively with a Lambda function. You can use Lambda functions to automate actions that are based on events, or you can schedule the actions to happen at a specific time. Lambda functions are straightforward to configure, and you could do even more with a Lambda function, such as automating how you order your inventory. If you want to learn more, you can explore the Lambda FAQs. In the meantime, I will show you an architecture that will work for your goal of sending a daily report.



Lab tasks overview

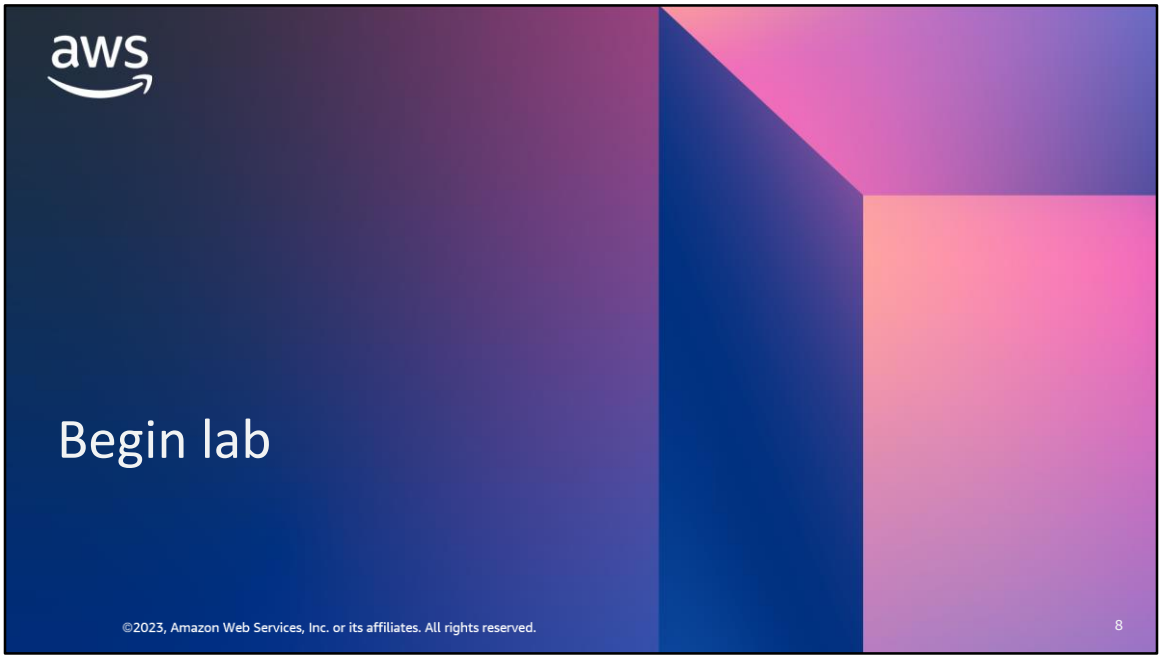
You will construct and implement a serverless computing solution by using AWS Lambda. The Lambda function will generate a sales analysis report by pulling data from a database and emailing the results on a daily basis.

In this activity, you deploy and configure an AWS Lambda based serverless computing solution. The Lambda function will generate a sales analysis report by pulling data from a database and emailing the results on a daily basis. The database connection information is stored in Parameter Store, a capability of AWS Systems Manager. The database itself runs on an EC2 LAMP instance.



This diagram shows the Lambda function-based serverless component architecture of the sales analysis report function of the café application. It also illustrates its flow, which consists of the following steps:

1. An Amazon CloudWatch event invokes the salesAnalysisReport Lambda function at 20:00 every day, Monday through Saturday.
2. The salesAnalysisReport Lambda function invokes another Lambda function, salesAnalysisReportDataExtractor, to retrieve the report data. Both functions receive the appropriate permissions to access the AWS resources. They receive these permissions through their assignment to the salesAnalysisReportRole and salesAnalysisReportDERole AWS Identity and Access Management (IAM) roles, respectively.
3. The salesAnalysisReportDataExtractor function runs an analytical query against the Café database (cafe_db) that runs in a LAMP instance on Amazon Elastic Compute Cloud (Amazon EC2). It uses the PyMySQL Python library in its implementation to access the MySQL database.
4. The query result is returned to the salesAnalysisReport function.
5. The salesAnalysisReport function formats the report into a message. It publishes the message to the salesAnalysisReportTopic Amazon Simple Notification Service (Amazon SNS) topic. Frank has an email subscription to this topic.
6. The salesAnalysisReportTopic SNS topic sends the message by email to Frank at the subscribed email address.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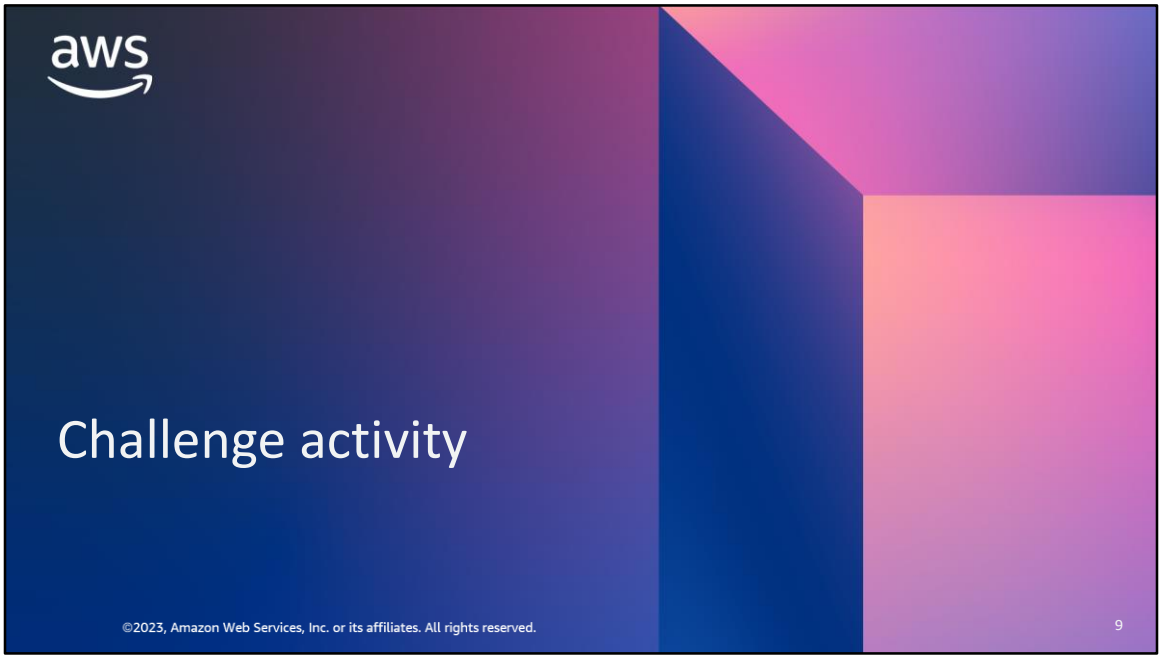


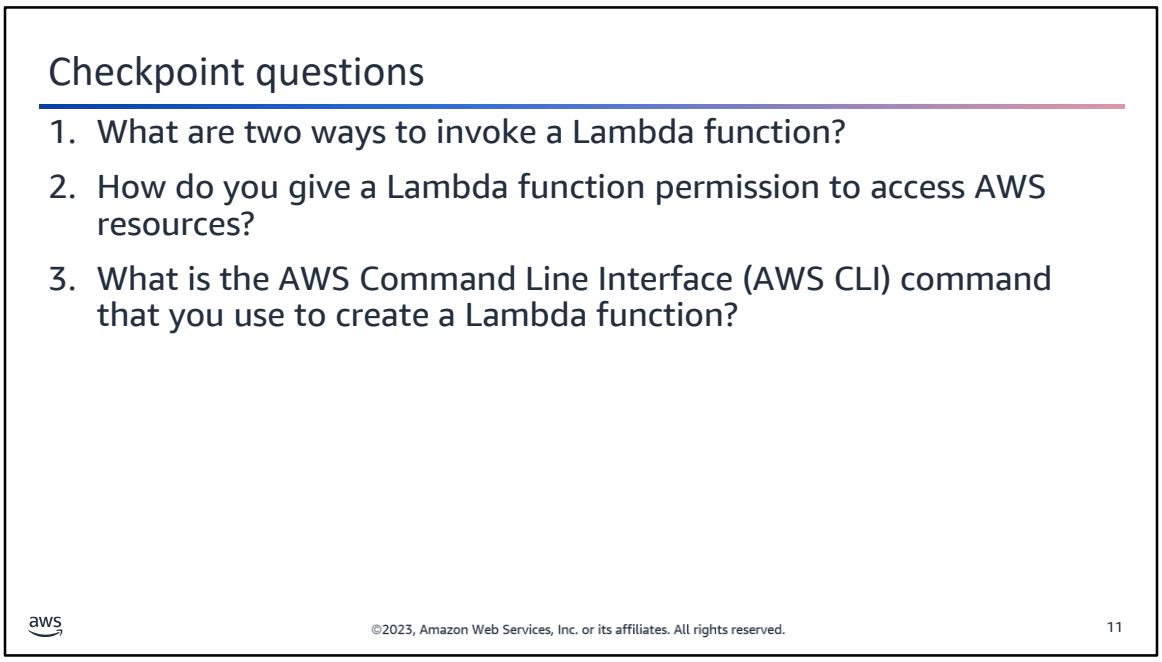
Challenge activity tasks

1. Create a Lambda function to count the number of words in a text file. The general requirements are as follows:
   a. Use the AWS Management Console to develop a Lambda function in Python and to create its required resources.
   b. Report the word count in **an email** using an SNS topic. Optionally, also send the result in an SMS (text) message.
   c. Format the response message as follows: The word count in the file *<textFileName>* is nnn.
   d. Replace *<textFileName>* with the name of the file.
   e. Specify the following email subject line: Word Count Result
   f. Automatically invoke the function when the text file is uploaded to an Amazon S3 bucket.
2. Test the function by uploading several text files with different word counts to the S3 bucket.
3. Forward the email produced by one of your tests to your instructor along with a screenshot of your Lambda function.

aws

The following are the lab tasks:

1. Create a Lambda function to count the number of words in a text file. The general requirements are as follows:
   a. Use the AWS Management Console to develop a Lambda function in Python and to create its required resources.
   b. Report the word count in an email using an SNS topic. Optionally, also send the result in an SMS (text) message.
   c. Format the response message as follows: The word count in the file <textFileName> is nnn.
   d. Replace *<textFileName>* with the name of the file.
   e. Specify the following email subject line: Word Count Result
   f. Automatically invoke the function when the text file is uploaded to an Amazon Simple Storage Service (Amazon S3) bucket.
2. Test the function by uploading several text files with different word counts to the S3 bucket.
3. Forward the email produced by one of your tests to your instructor along with a screenshot of your Lambda function.



The answers to the questions are as follows:

1. What are two ways to invoke a Lambda function?

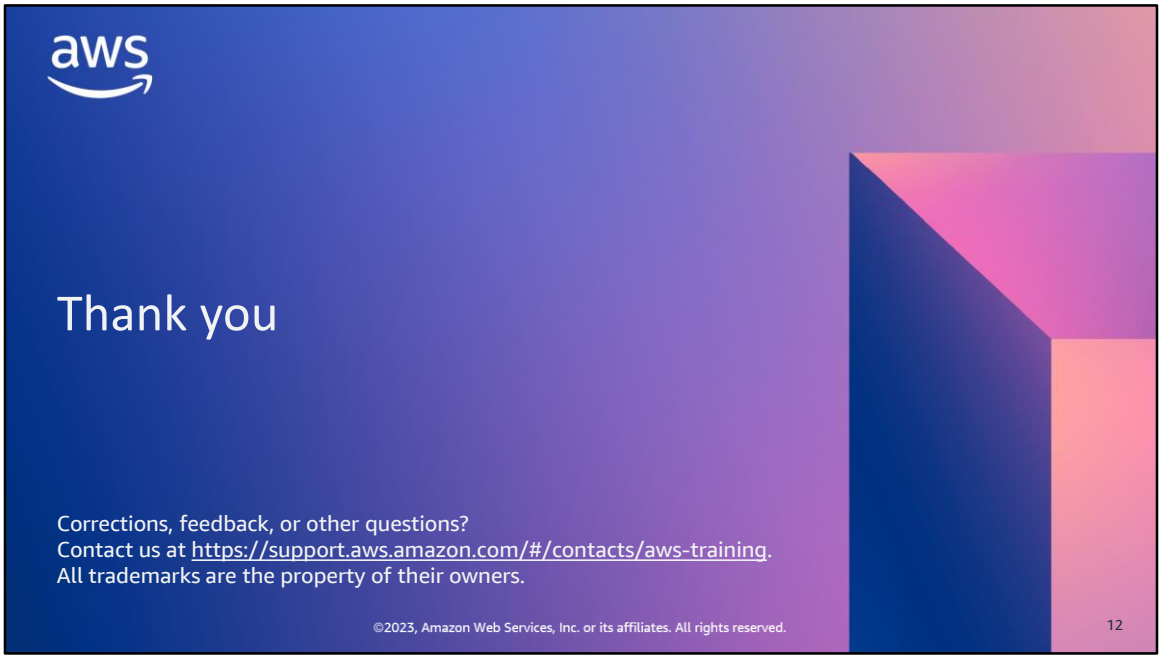
   You can invoke a Lambda function based on a schedule: for example, at a particular time on a particular day. You can also invoke a Lambda function based on an event: for example, when a file is uploaded to an S3 bucket.

2. How do you give a Lambda function permission to access AWS resources?

   You create an IAM role with the desired permissions and assign the role to the function.

3. What is the AWS Command Line Interface (AWS CLI) command that you use to create a Lambda function?

   aws lambda create-function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