AWS Academy Cloud Foundations Report

Title Page:

- Report Title: AWS Academy Cloud Foundations Report
- Name: Rohith Yellambalase Vijayakumar
- Course: AWS Academy Cloud Foundations
- Date: Feb 3, 2025
  GWID: G26286080

Certificate of Completion:

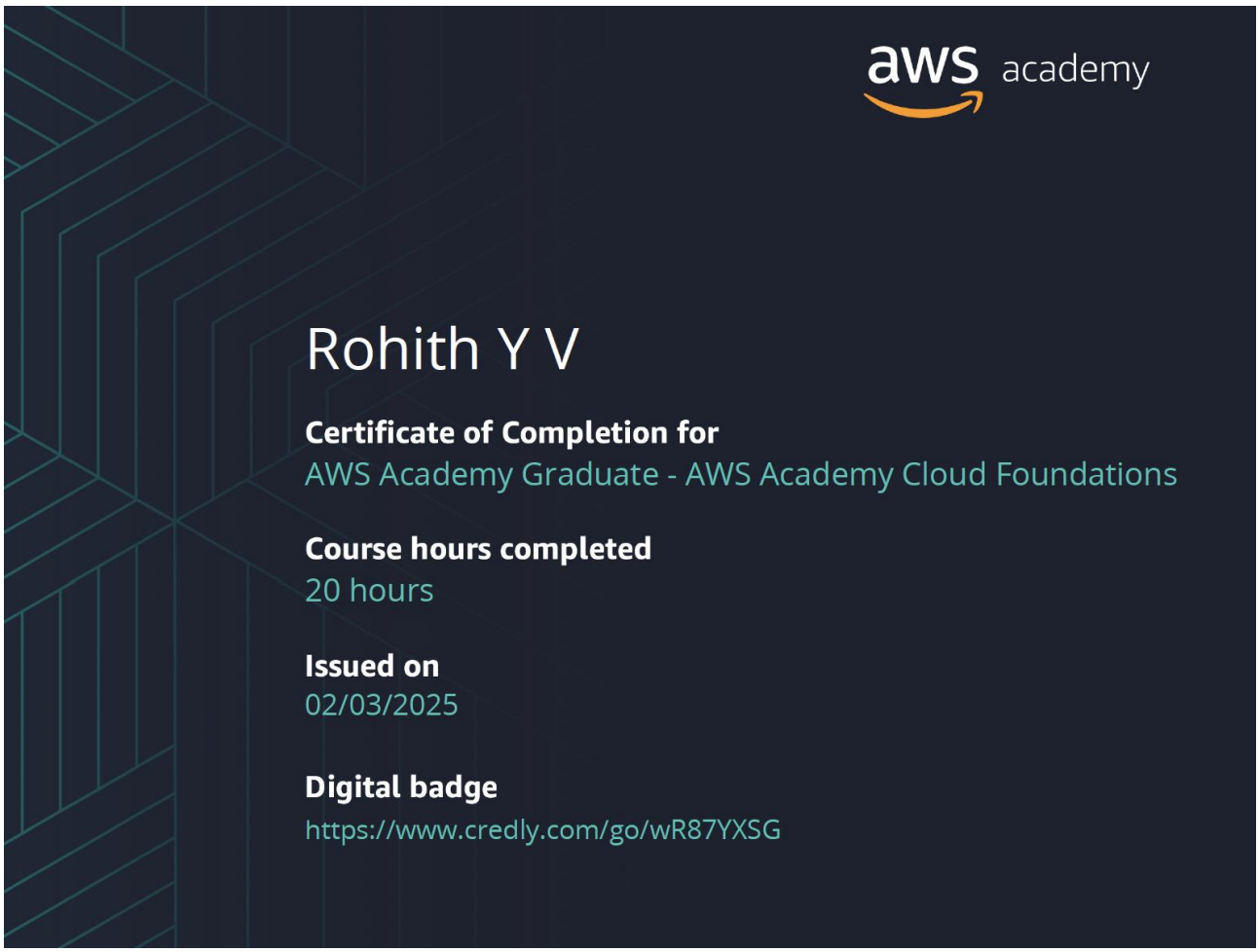


Table of Contents:

Introduction:

This report provides an overview of the AWS Academy Cloud Foundations course, covering key concepts, hands-on labs, and knowledge checks for each module. The course introduces fundamental cloud computing principles, AWS services, security, and best practices. Each section includes key learnings, lab results, and screenshots to validate completion.

Module 1: Cloud Concepts Overview

1. Summary of Lessons Learned

After going through this module, I now understand:

- The different types of cloud computing models.
- Six key benefits of cloud computing.
- The main AWS service categories and their core services.

- The AWS Cloud Adoption Framework (AWS CAF) and how it helps organizations transition to the cloud effectively.

2. Key Learnings

Some of the important takeaways for me from this module are:

- Moving to the cloud is a gradual process that requires proper planning and alignment across the organization.
- AWS CAF is a structured approach designed to help organizations create clear and effective cloud adoption strategies.
- AWS CAF is divided into six focus areas, known as perspectives.
- Each perspective includes specific business or technical capabilities that different stakeholders are responsible for.

Knowledge Check Completion 1

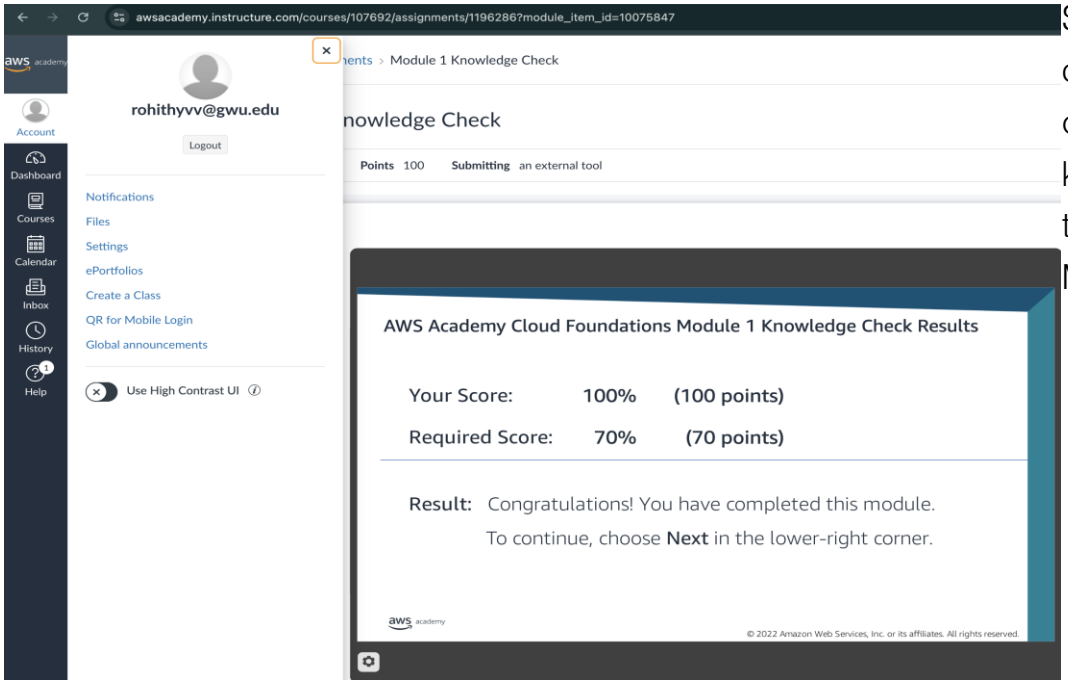


Fig. 1. Successful completion of knowledge test for Module 1

Note: AWS Academy Cloud Foundations Module 1 Knowledge Check passed with a perfect score of 100%.

Module 2: AWS Global Infrastructure

1. Summary of Lesson Learned

In this module, I explored the fundamentals of AWS pricing, reviewed Total Cost of Ownership (TCO) concepts, and learned how to create an estimate using the AWS Pricing Calculator.

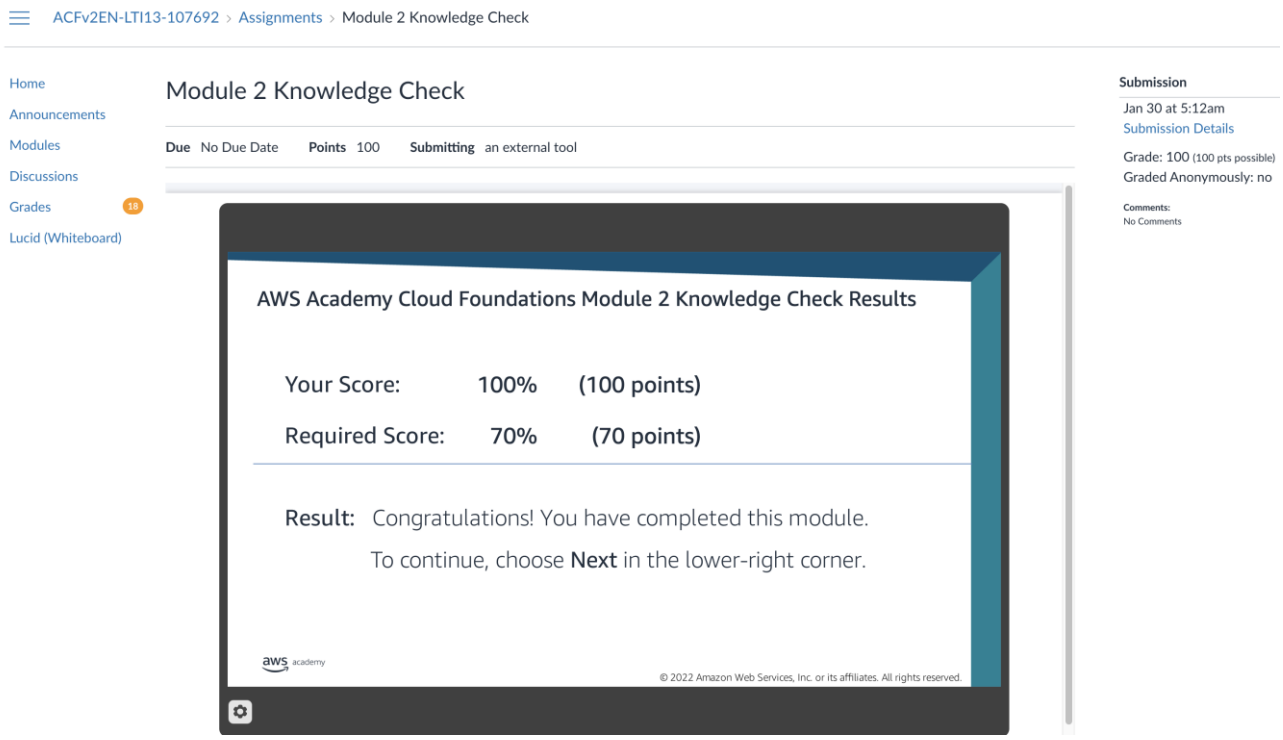
2. Key Learnings

Some key takeaways from this module include:

- Total Cost of Ownership (TCO) helps compare costs associated with different deployments. AWS provides the AWS Pricing Calculator to estimate cost savings.
- The AWS Pricing Calculator allows users to estimate monthly costs, identify cost-saving opportunities, model solutions before implementation, explore price points, and find suitable instance types and contracts.
- AWS Billing and Cost Management offers tools like AWS Bills, AWS Cost Explorer, AWS Budgets, and AWS Cost and Usage Reports to help users understand and optimize their AWS costs and usage.
- Understanding AWS costs and usage enables better planning and more efficient AWS implementation.

Knowledge Check Completion 2

Fig. 2. Successful completion of knowledge test for Module 2



Note: AWS Academy Cloud Foundations Module 2 Knowledge Check passed with a perfect score of 100%.

Module 3: AWS Global Infrastructure

Module 3: AWS Global Infrastructure

In Module 3, 'AWS Global Infrastructure Overview,' I was introduced to the components of AWS Global Infrastructure, including Regions, Availability Zones, network infrastructure, and Points of Presence. I learned how each component plays a crucial role in delivering cloud services globally. I also explored the different AWS service categories and identified the specific services covered in this course. Finally, I participated in a clickthrough activity on the AWS Management Console to get hands-on experience with the practical aspects of using AWS services.

1. Summary of Lesson Learned

In this module, I learned about AWS's global infrastructure, including the differences between AWS Regions, Availability Zones, and Edge Locations. I also explored AWS service categories that help ensure scalability, security, and resilience.

2. Key Learnings

Some key takeaways from this module include:

- **AWS Regions and Availability Zones:** AWS Regions are geographically separate areas containing multiple Availability Zones. These Availability Zones consist of isolated data centers that improve reliability and fault tolerance.
- **AWS Edge Locations and Local Zones:** Edge Locations support services like Amazon CloudFront, reducing latency by caching content closer to users. AWS Local Zones provide low-latency access for workloads that need to stay close to end users.
- **AWS Networking and Resilience:** AWS has a highly redundant global network connecting Regions and Availability Zones, ensuring low-latency, secure communication for applications.

3. Knowledge Check Module 3

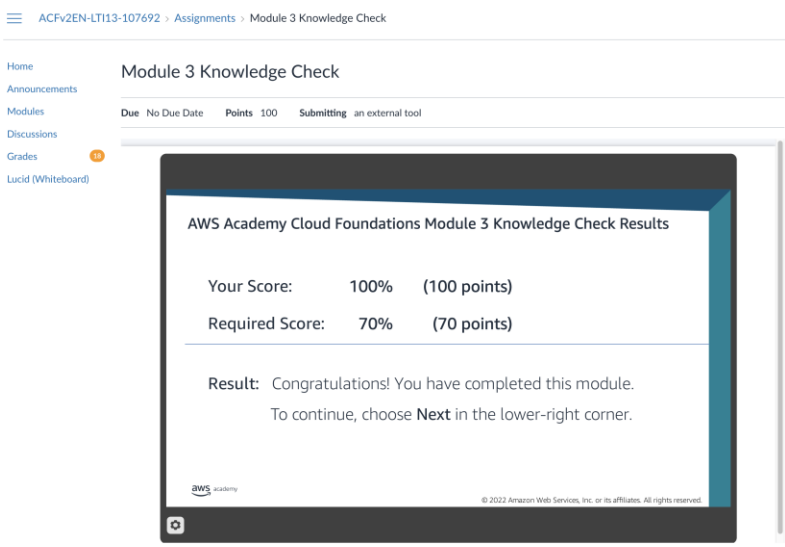


Fig. 3. Successful completion of knowledge test for Module

Note: AWS Academy Cloud Foundations Module 3 Knowledge Check passed with a perfect score of 100%.

Module 4: AWS Global Infrastructure

In Module 4, 'AWS Cloud Security,' I learned about AWS's security approach, including the shared responsibility model and the importance of AWS Identity and Access Management (IAM). I gained an understanding of the fundamentals of securing a new AWS account and explored various features and services like AWS Organizations and AWS Shield for enhanced security. I also studied methods for securing data on AWS, focusing on encryption and secure storage with Amazon S3. Finally, I gained insights into ensuring compliance with laws and regulations using AWS services, learning about AWS's certifications and compliance-supporting services.

1. Summary of Lesson Learned

In this module, I learned about AWS security concepts, including the shared responsibility model, Identity and Access Management (IAM), and best practices for securing AWS accounts and data. Additionally, I explored AWS compliance programs and security credential types.

2. Key Learnings

Some key takeaways from this module include:

- **Shared Responsibility Model:** Security in AWS is shared between AWS and the customer. AWS is responsible for securing the cloud infrastructure, while customers are responsible for securing their applications and data.
- **IAM Users, Groups, and Roles:** IAM helps manage permissions and access control. IAM users, groups, and roles allow fine-grained control over who can access AWS resources and what actions they can perform.
- **Securing AWS Accounts:** Best practices include enabling multi-factor authentication (MFA), using IAM roles instead of root accounts, and regularly reviewing security credentials.
- **AWS Compliance Programs:** AWS provides compliance certifications and frameworks, ensuring organizations can meet industry regulations and security standards.

3. Knowledge Check Completion

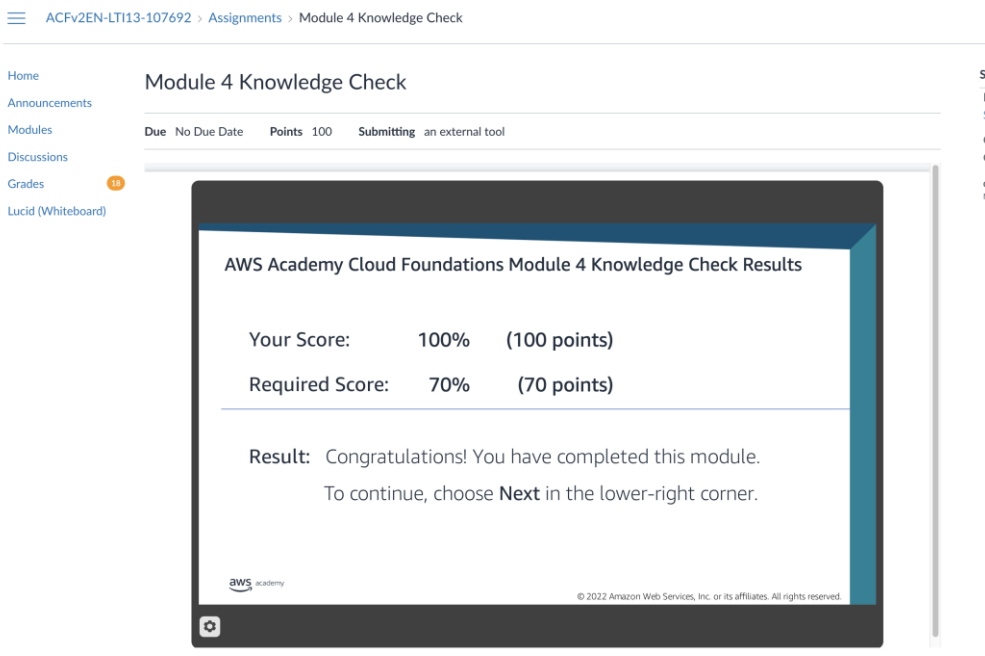
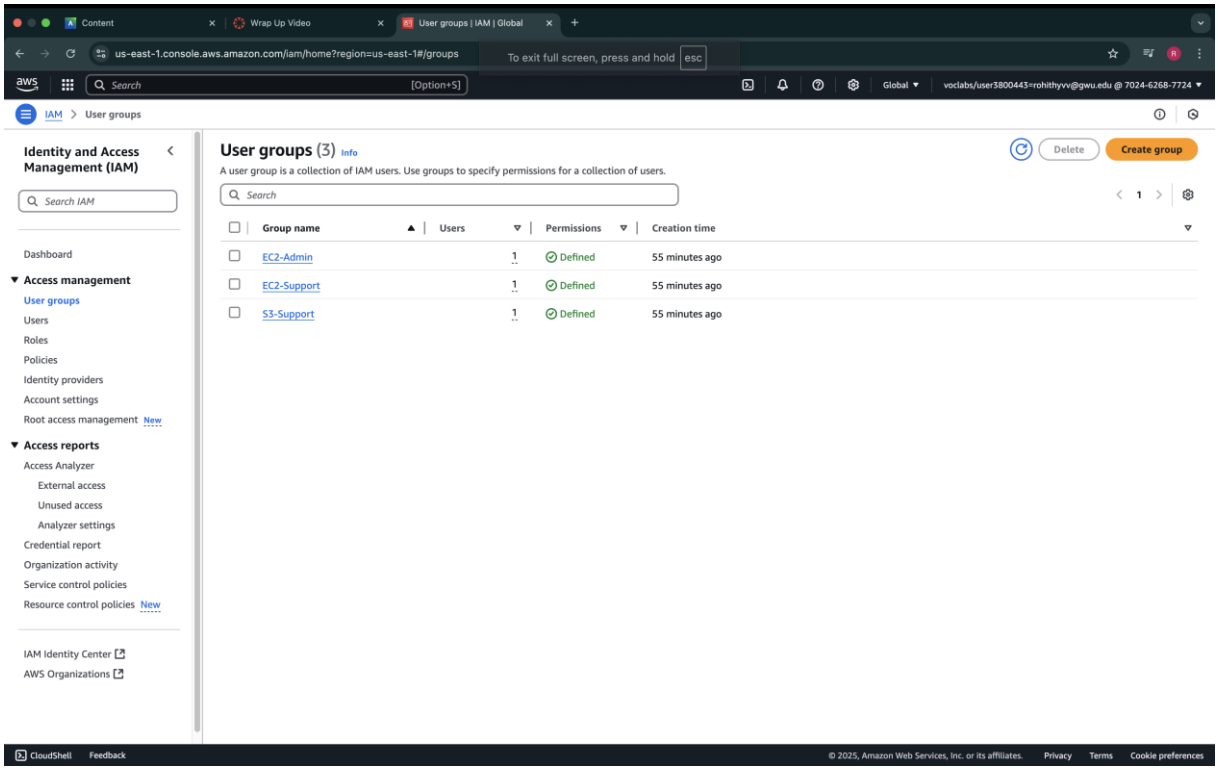


Fig. 4. Successful completion of knowledge test for Module 4

Note: AWS Academy Cloud Foundations Module 4 Knowledge Check passed with a perfect score of 100%.

Fig. 5. Lab 1 – Introduction to AWS IAM



Note: Using the AWS service IAM, created a new user ‘user-1’ and successfully logged in with the user-1 and verified the access controls of user-1.

This image shows the AWS Identity and Access Management (IAM) console, highlighting user groups like EC2-Admin, EC2-Support, and S3-Support, with defined permissions for managing AWS resource access.

From this lab, I learned how to manage user groups in AWS Identity and Access Management (IAM). I created user groups such as **EC2-Admin**, **EC2-Support**, and **S3-Support**, assigned users to these groups, and defined permissions to control access to AWS resources. This helped me understand the importance of organizing users based on roles and managing their permissions efficiently. Additionally, I explored how IAM enhances security by enabling role-based access control and minimizing the risk of unauthorized access.

Module 5: AWS Global Infrastructure

In Module 5, I learned the basics of AWS networking and content delivery, focusing on Amazon VPC, Amazon Route 53, and Amazon CloudFront. I engaged in hands-on activities, designing and building a VPC, and learned how to secure it using network ACLs and security groups. I studied essential networking concepts, explored various VPC networking options, and delved into DNS resolution and high availability with Amazon Route 53. Finally, I gained an understanding of the features and benefits of Amazon CloudFront in content delivery.

- Summary of Lesson Learned

In this module, I learned about the fundamentals of networking in AWS, including Amazon VPC, Route 53, and CloudFront. I explored how to design and customize a Virtual Private Cloud (VPC) and understand key networking components such as security groups and subnets.

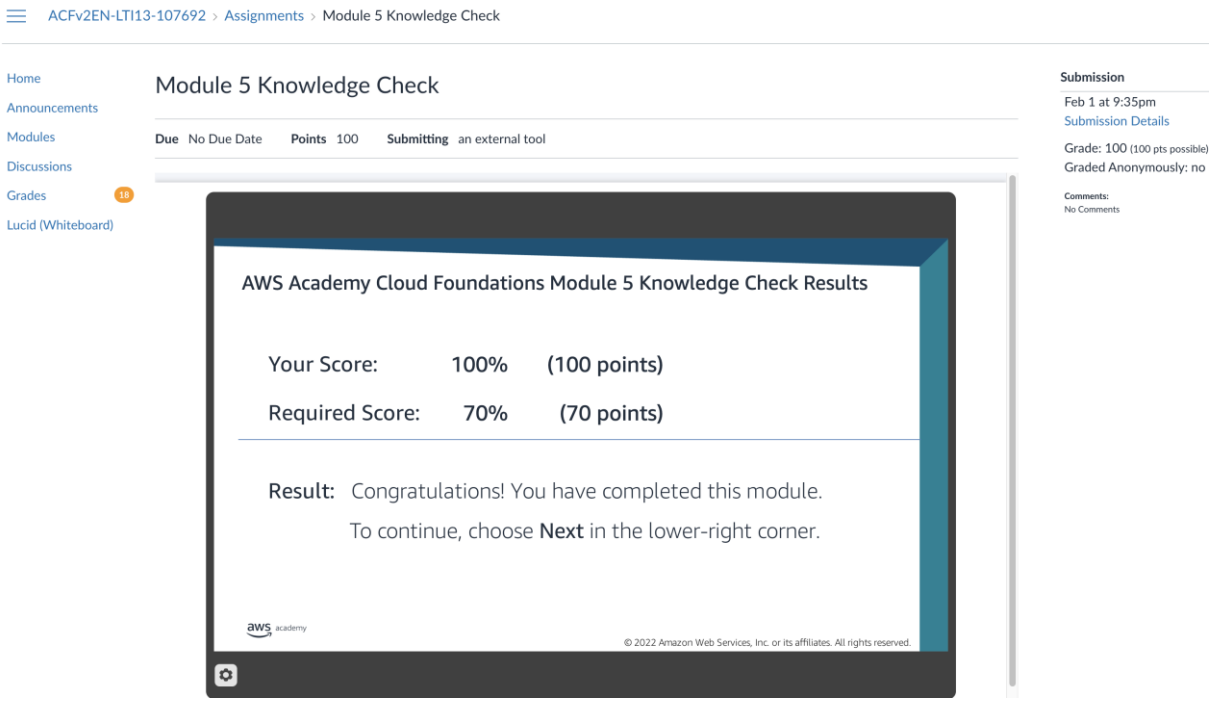
2. Key Learnings

Some key takeaways from this module include:

- Amazon VPC and Virtual Networking: Amazon VPC enables users to create isolated cloud networks with customizable IP address ranges, subnets, route tables, and security settings.
- Building a Secure VPC: Security groups and network ACLs help control inbound and outbound traffic within a VPC, ensuring a secure cloud environment.
- Amazon Route 53: A scalable DNS web service that routes end users to AWS applications efficiently while improving availability and performance.
- Amazon CloudFront: A content delivery network (CDN) that delivers content with low latency by caching it at Edge Locations closer to users.

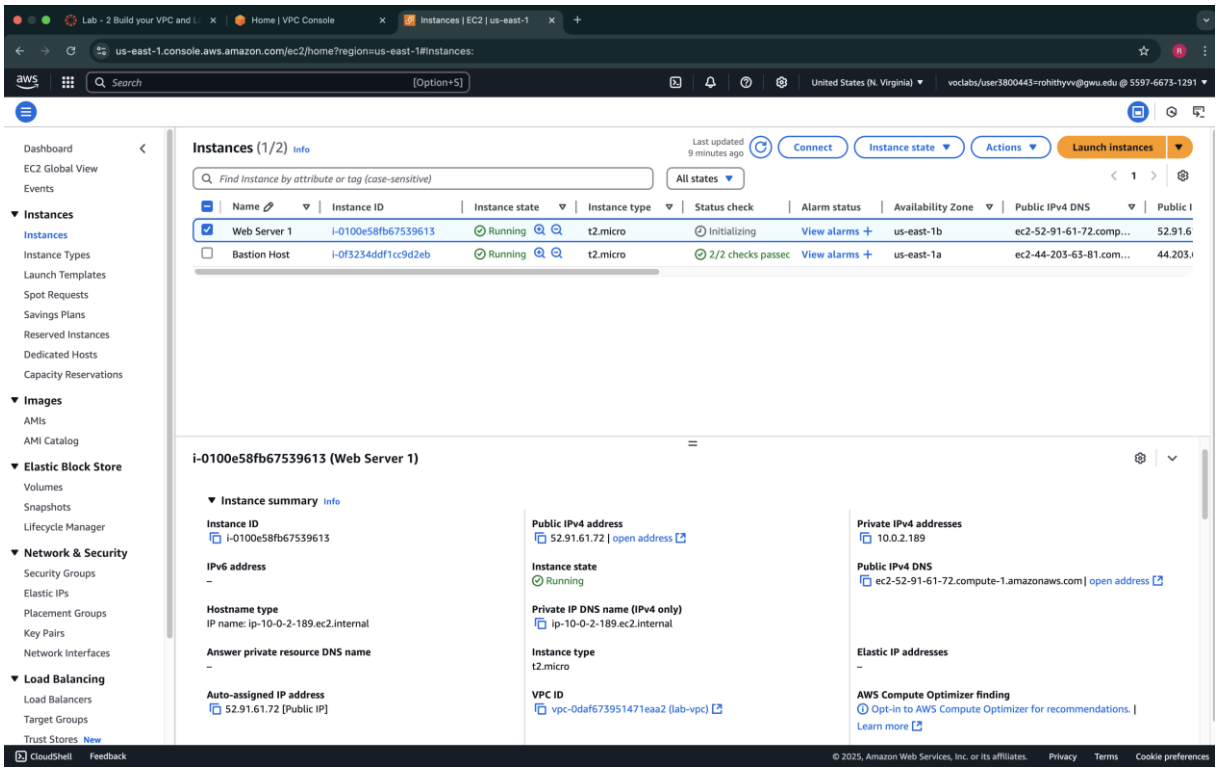
3. Knowledge Check Completion

Fig. 6. Successful completion of knowledge test for Module 5



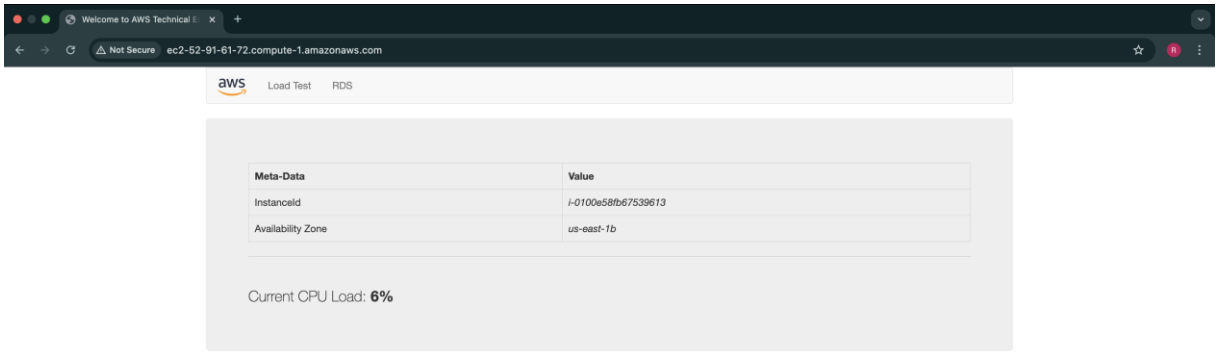
Note: AWS Academy Cloud Foundations Module 5 Knowledge Check passed with a perfect score of 100%.

Fig. 7. Lab 2 – Build your VPC and Launch a Web Server



In this lab, I created a Virtual Private Cloud (VPC) using Amazon Web Services (AWS), configured subnets, and set up a security group. I then launched an EC2 instance within the VPC and configured it to run a web server, gaining hands-on experience in building a customized network infrastructure on AWS.

Note: Using the AWS service, VPC created a VPC workflow and successfully launched a web server.



Module 6: AWS Global Infrastructure

- Summary of Lesson Learned

In this module, I learned about different AWS compute services, including Amazon EC2, AWS Lambda, AWS Elastic Beanstalk, and containerized applications. I explored how to create and manage virtual computing environments and optimize costs using AWS compute options.

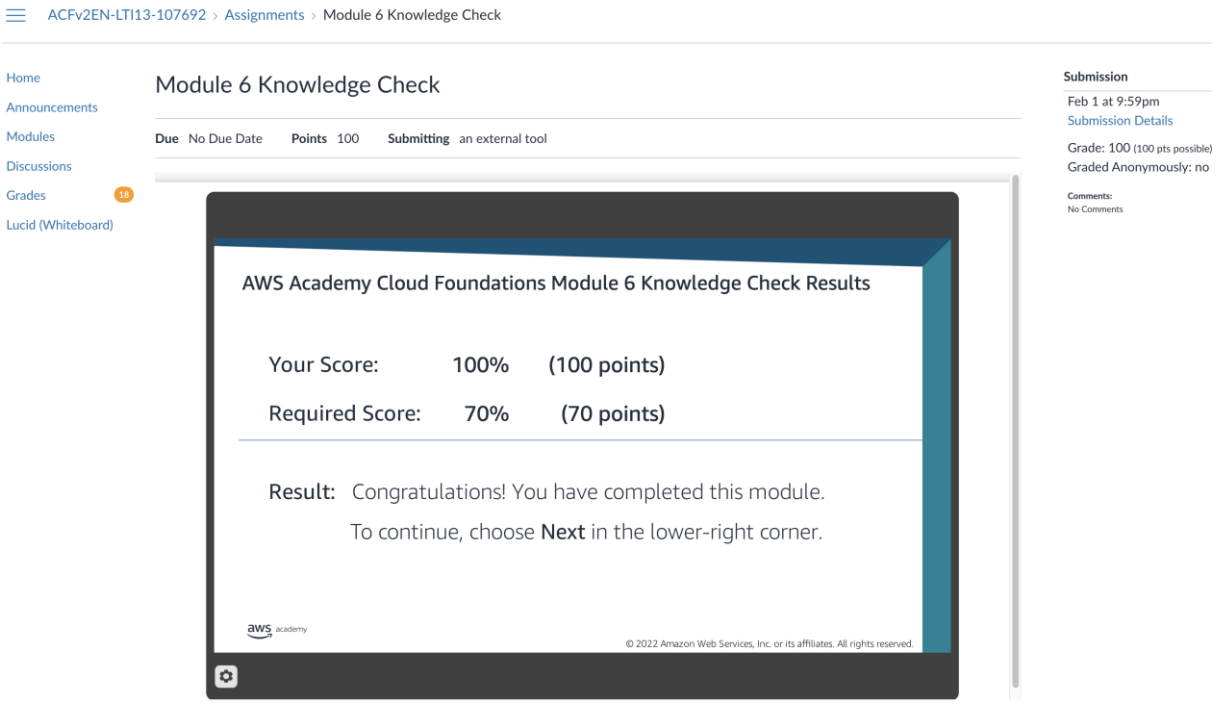
2. Key Learnings

Some key takeaways from this module include:

- Amazon EC2 and Virtual Computing: Amazon EC2 provides scalable virtual servers, allowing users to manage computing capacity based on demand.
- Amazon EC2 Cost Optimization: Features like Reserved Instances, Spot Instances, and Auto Scaling help optimize costs and resource utilization.
- AWS Elastic Beanstalk: A Platform-as-a-Service (PaaS) that simplifies deploying and managing web applications without managing infrastructure.
- AWS Lambda: A serverless compute service that runs code in response to events, eliminating the need to manage servers.
- Containerized Applications: AWS supports running containerized applications using Amazon ECS and Amazon EKS, enabling scalable and managed container orchestration.

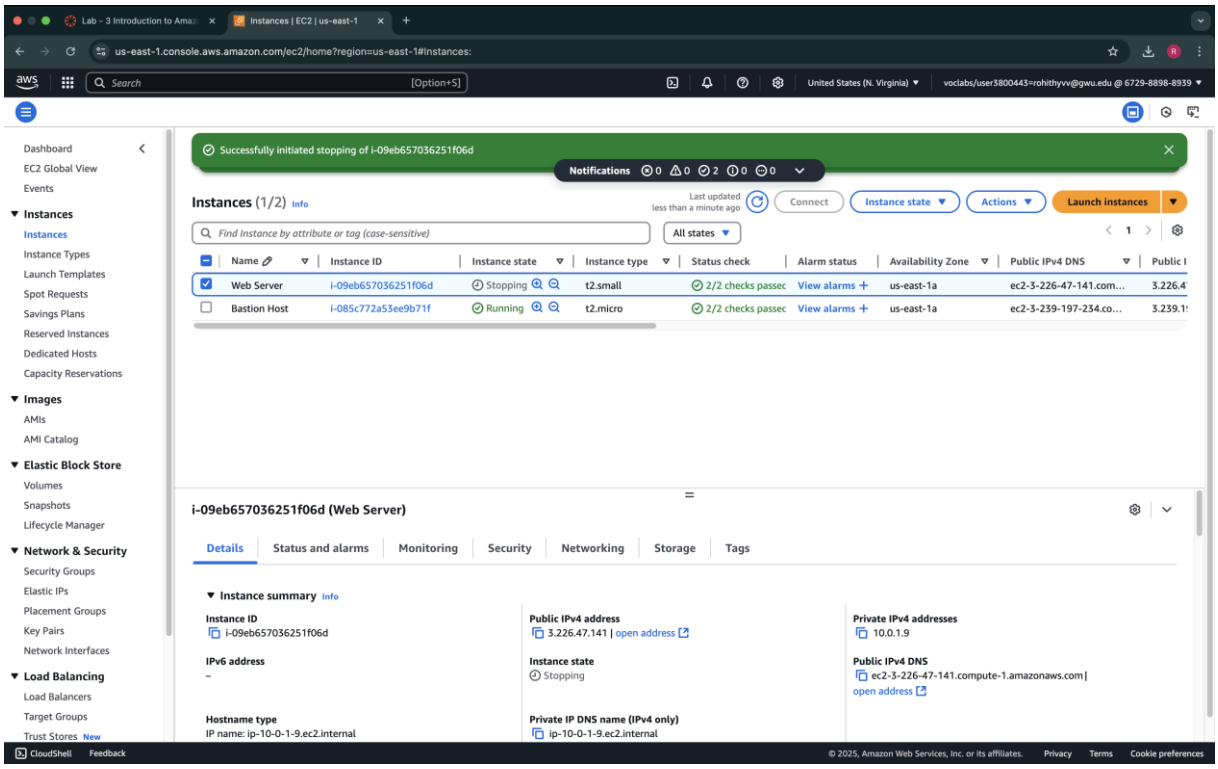
3. Knowledge Check Completion

Fig. 8. Successful completion of knowledge test for Module 6



Note: AWS Academy Cloud Foundations Module 6 Knowledge Check passed with a perfect score of 100%.

Fig. 9. Lab 3 – Introduction to Amazon EC2



Note: The screenshot displays an AWS EC2 console with two instances. The "Web Server" is stopping, while the "Bastion Host" is running. It highlights crucial instance details like IDs, types, states, and IP addresses, indicating your familiarity with managing and monitoring instance lifecycles on AWS.

Module 7: AWS Global Infrastructure

Summary of Lesson Learned:

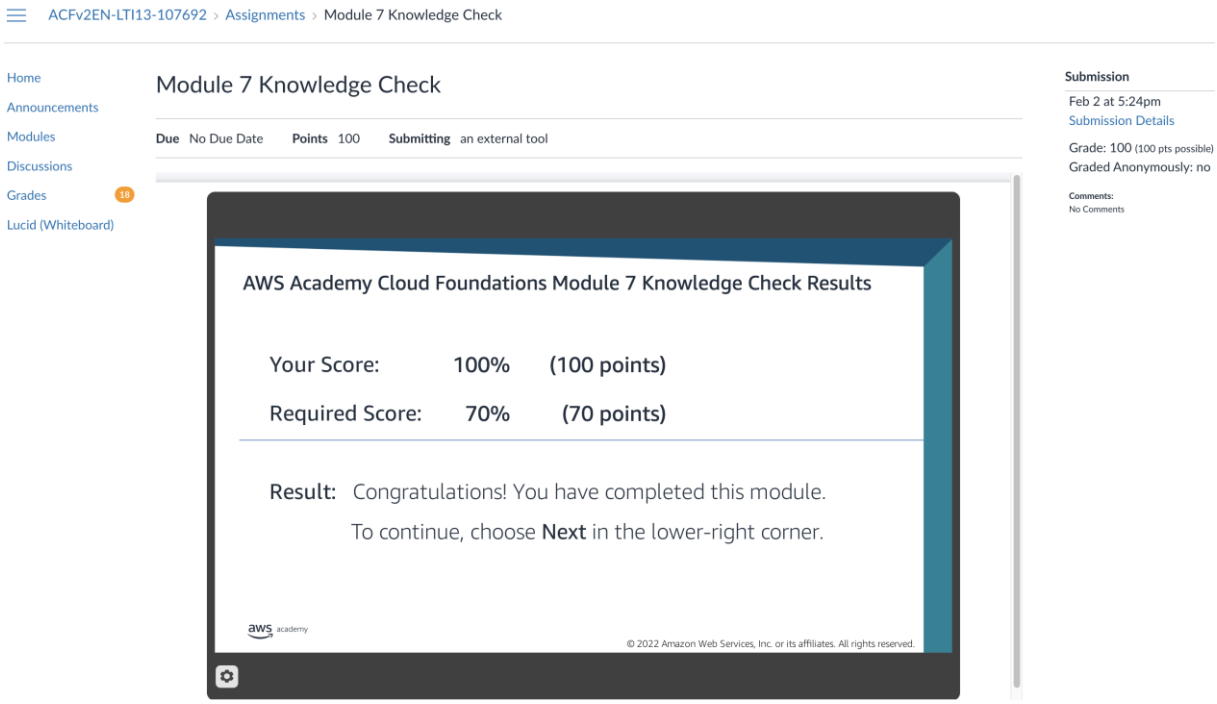
In this module, I learned about the different types of storage available within the AWS Global Infrastructure. I gained insights into Amazon S3, EBS, EFS, and S3 Glacier, understanding how they function and how to use them in various scenarios. I also learned to differentiate between these storage solutions and their best-use cases.

Key Learnings:

1. **Amazon S3 (Simple Storage Service)**: I learned that Amazon S3 is a scalable object storage service that allows you to store and retrieve any amount of data at any time. It is highly durable and is designed for use in a variety of data storage needs, from backup to archival.
2. **Amazon EBS (Elastic Block Store)**: I understood that Amazon EBS provides block-level storage volumes for use with Amazon EC2 instances. It allows for persistent storage that can be attached to EC2 instances, making it suitable for databases and transactional applications.
3.

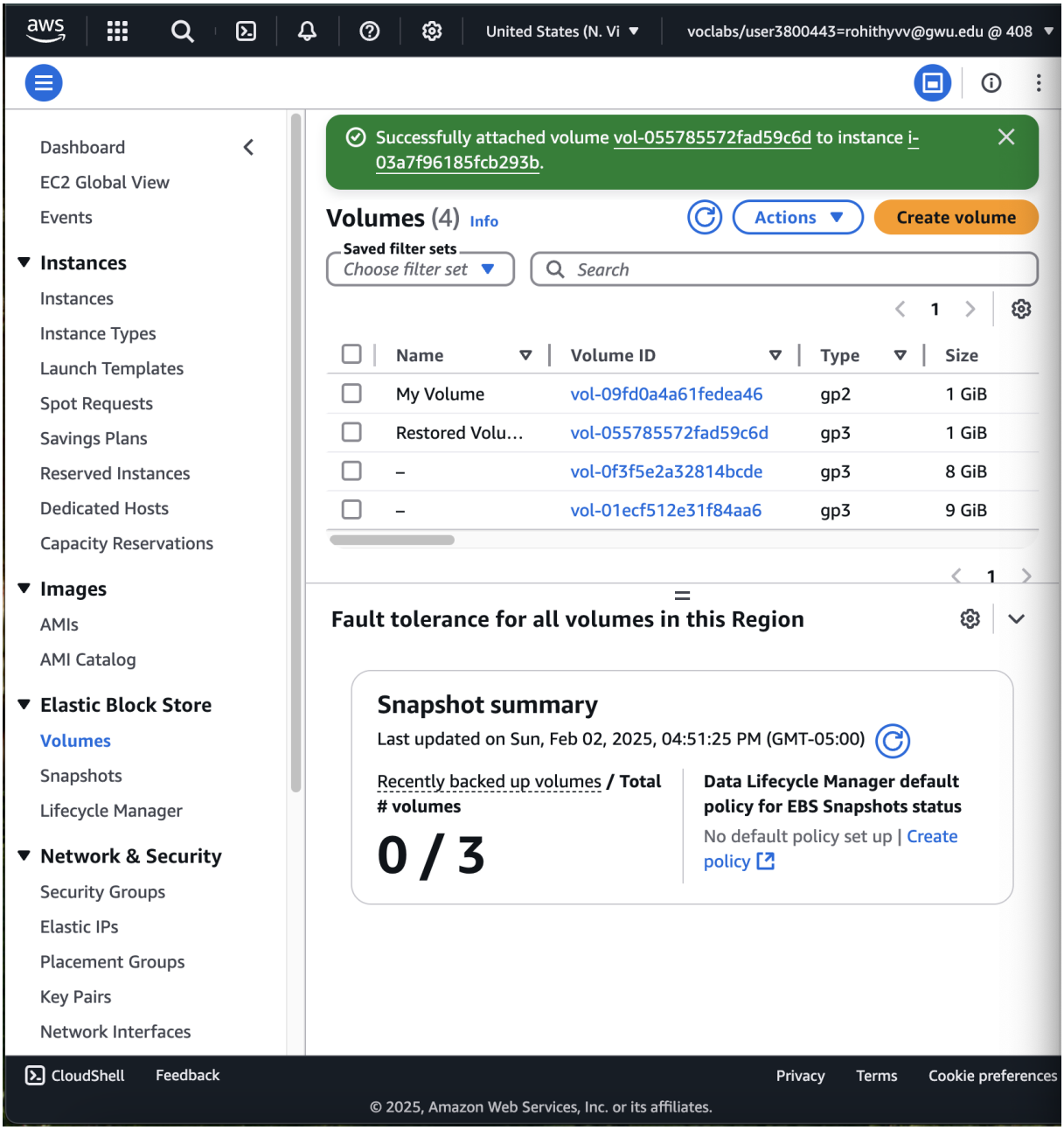
Knowledge Check Completion:

Fig. 10. Successful completion of knowledge test for Module 7



Note: AWS Academy Cloud Foundations Module 7 Knowledge Check passed with a perfect score of 100%.

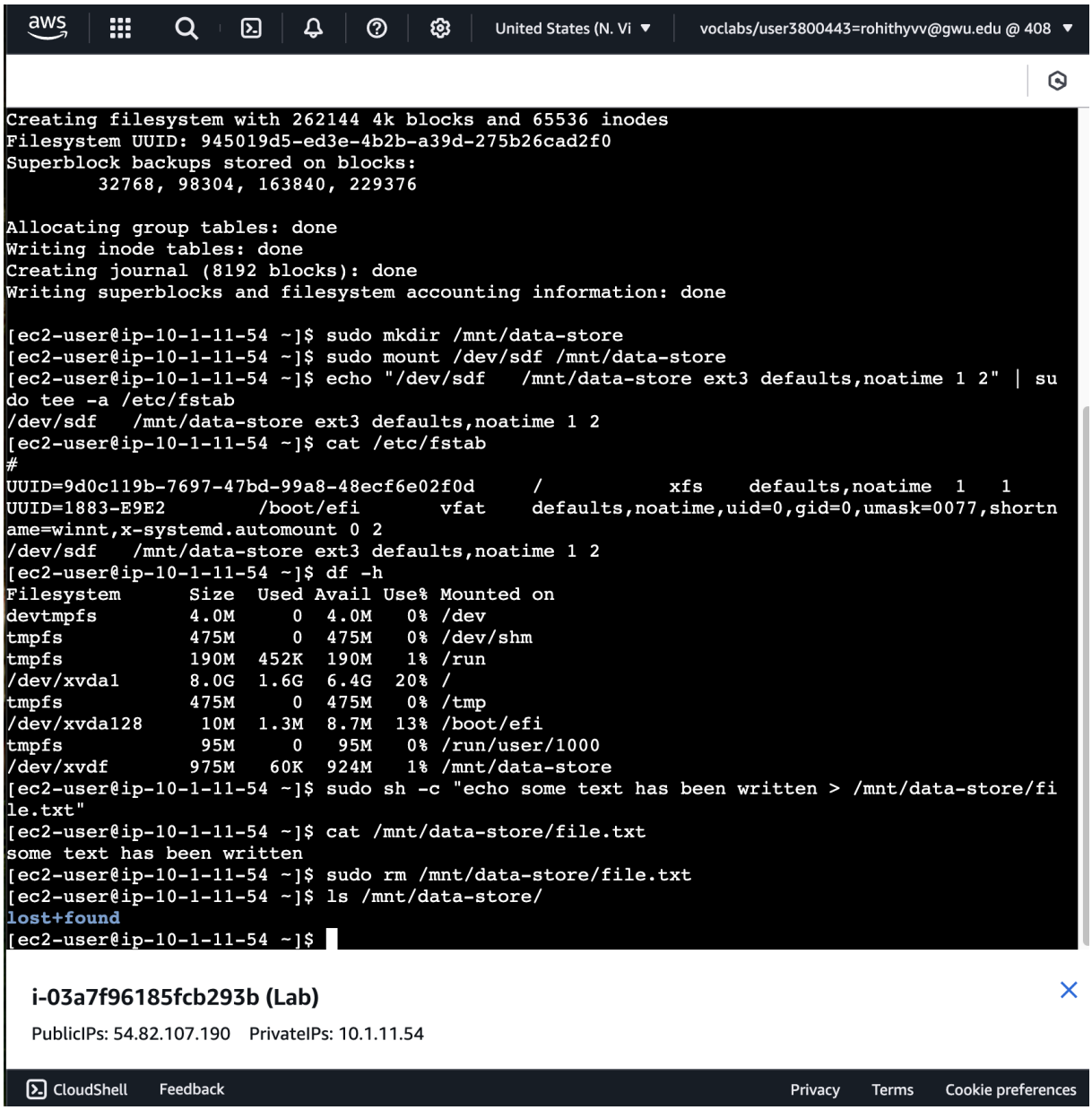
Fig. 11.1 Lab 4 – Working with EBS



Note: Created an EBS volume and attached it to an EC2 instance. This highlights the AWS Lambda console for the "myStopinator" function, triggered every minute by EventBridge. It includes details on memory and storage configuration, demonstrating my understanding of AWS Lambda functions and

their configurations.

Fig. 11.2 Connecting to EBS volume by connecting with SSH



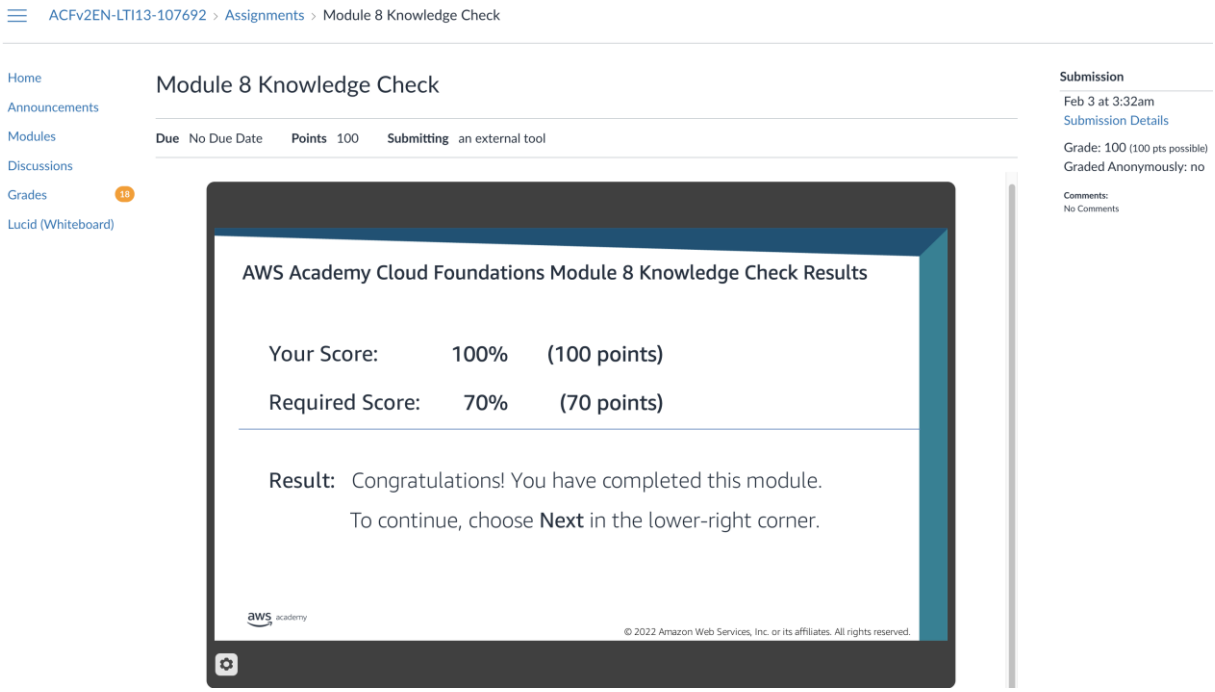
Note: Creating a snapshot of EBS volume. Amazon EBS snapshots are stored in Amazon S3 with high durability. New Amazon EBS volumes can be created out of snapshots for cloning or restoring backups

- Summary of Lessons Learned:
  In this module, I gained a deeper understanding of the AWS Global Infrastructure and its services. Specifically, I learned about Amazon RDS, DynamoDB, Redshift, and Aurora. I explored how these services function and how to interact with them effectively. I also learned how to perform essential tasks in Amazon RDS, such as launching and configuring a database.

Key Learnings:

- Amazon RDS (Relational Database Service): I learned how Amazon RDS provides a scalable and cost-efficient way to manage relational databases in the cloud. It automates tasks like backups, patch management, and failover, making it easier to manage databases without manual intervention.
- Amazon DynamoDB: I understood how DynamoDB is a fully managed NoSQL database service designed to handle large-scale, low-latency applications. It's highly scalable and can automatically scale to accommodate changes in traffic.

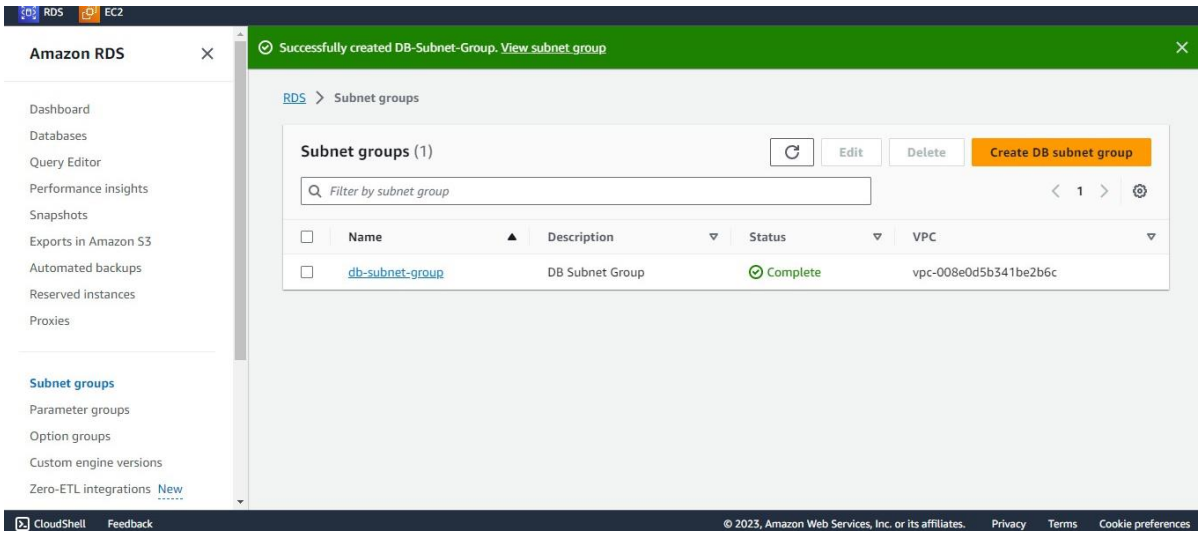
Fig. 12. Successful completion of knowledge test for Module 8



Note: AWS Academy Cloud Foundations Module 8 Knowledge Check passed with a perfect score of 100%.

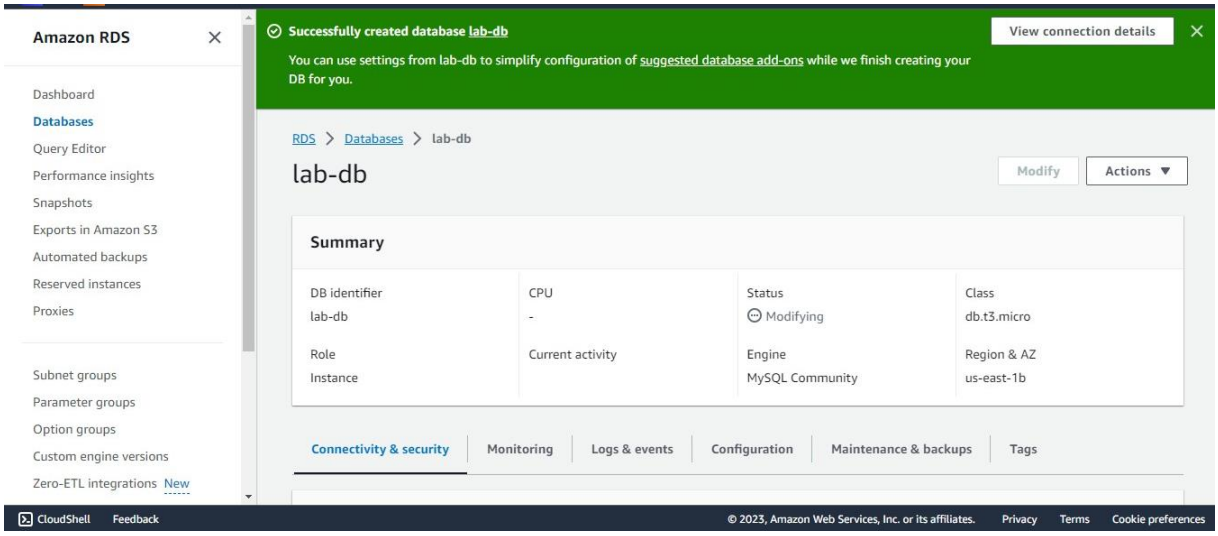
Fig. 13.1 Lab 5 – Build a Database Server

In this lab, I launched an Amazon RDS DB instance with high availability, configured it to allow connections from a web server, and interacted with the database through a web application, gaining practical experience in cloud-based relational database management.



Note: Created a DB subnet group that is used to tell RDS which subnets can be used for the database

Fig. 13.2 Creating a database



Note: Launched a Multi-AZ Amazon RDS for MySQL database instance. Amazon RDS Multi-AZ deployments provide enhanced availability and durability for Database (DB) instances

Module 9: AWS Global Infrastructure

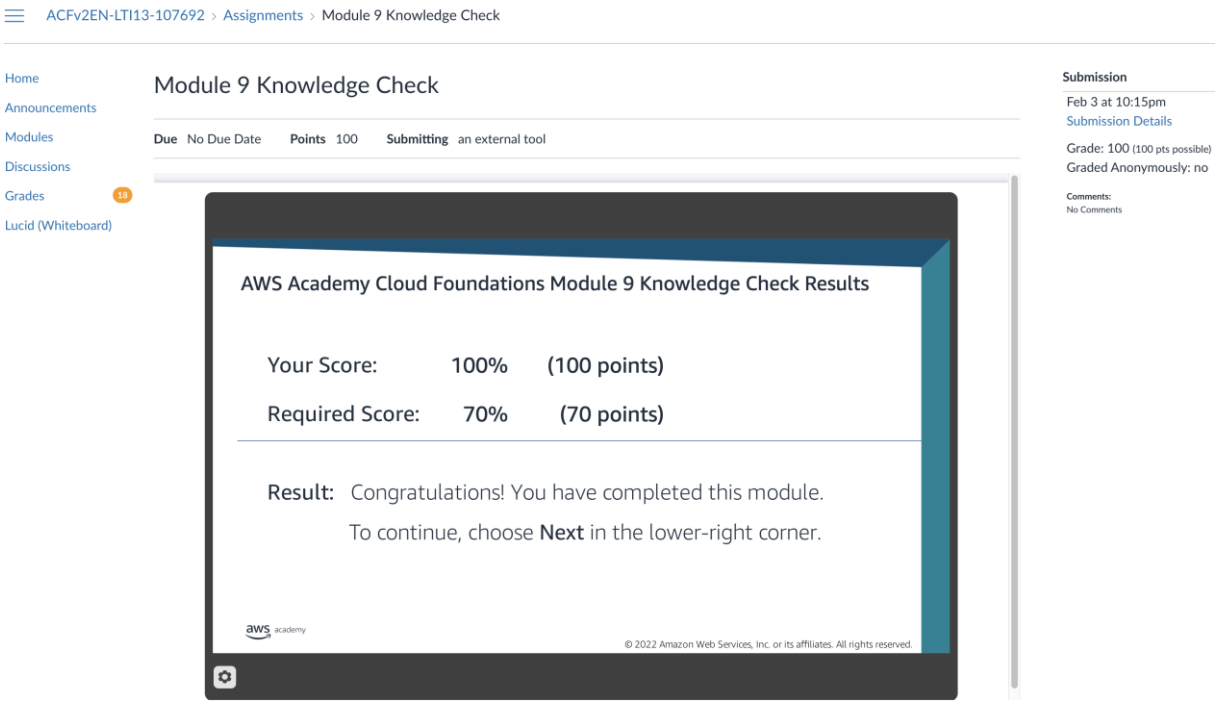
- **Summary of Lessons Learned:**
  In this module, I learned about the AWS Well-Architected Framework and its six pillars. I explored the design principles behind the framework and understood the significance of building reliable and highly available systems on AWS. I also learned how AWS Trusted Advisor can assist customers in optimizing their cloud environments, with insights on interpreting its recommendations for better resource management.

Key Learnings:

1. **AWS Well-Architected Framework**: I gained a comprehensive understanding of the six pillars of the AWS Well-Architected Framework, which include operational excellence, security, reliability, performance efficiency, cost optimization, and sustainability. These pillars guide best practices for building and maintaining cloud architectures.
2. **AWS Trusted Advisor**: I learned how AWS Trusted Advisor provides real-time guidance to help customers provision their AWS resources following best practices. Its recommendations cover areas such as cost optimization, security, fault tolerance, and performance improvement.

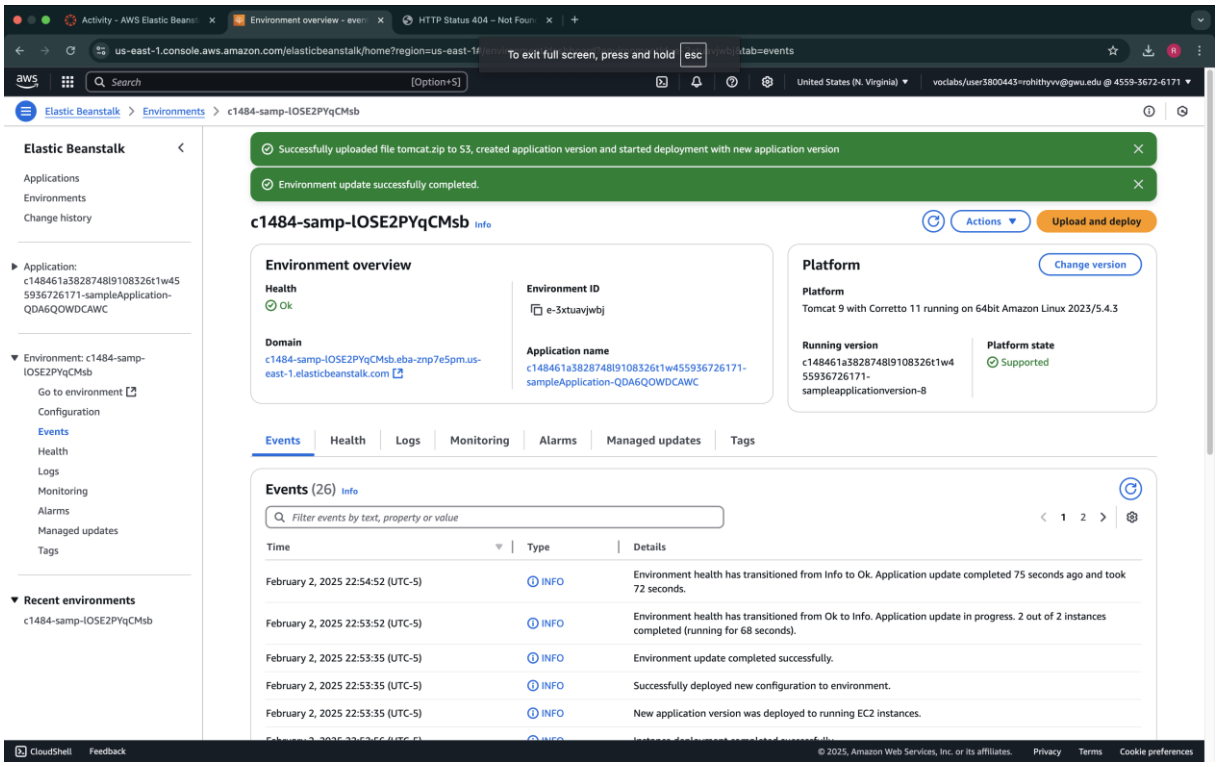
Knowledge Check Completion:

Fig. 14. Successful completion of knowledge test for Module 9



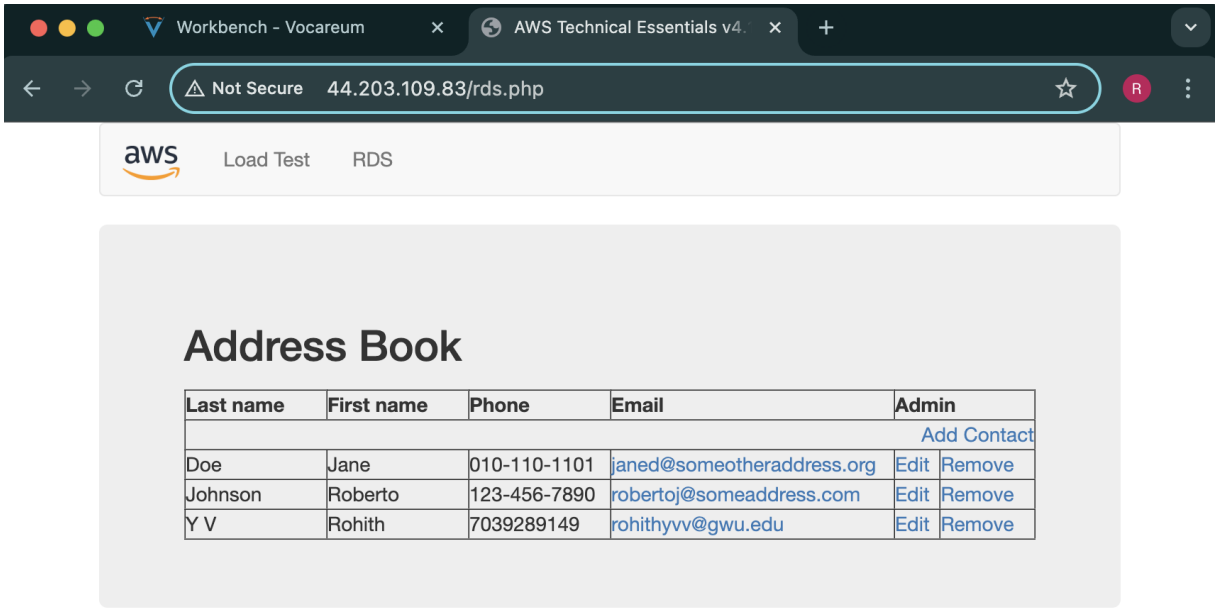
Note: AWS Academy Cloud Foundations Module 9 Knowledge Check passed with a perfect score of 100%.

Fig 14.a AWS Elastic Beanstalk Environment Overview and Events



Note: This shows the AWS Elastic Beanstalk console, highlighting environment health, domain, platform (Tomcat 9 with Corretto 11), and recent updates, such as application updates and deployments.

Fig 14 b AWS Address Book Interface with Contact Management Options



Note: This shows a web interface for an address book hosted on an AWS server. The address book lists contacts with columns for last name, first name, phone, email, and admin actions, such as edit and remove options.

Module 10: AWS Global Infrastructure

Summary of Lessons Learned:

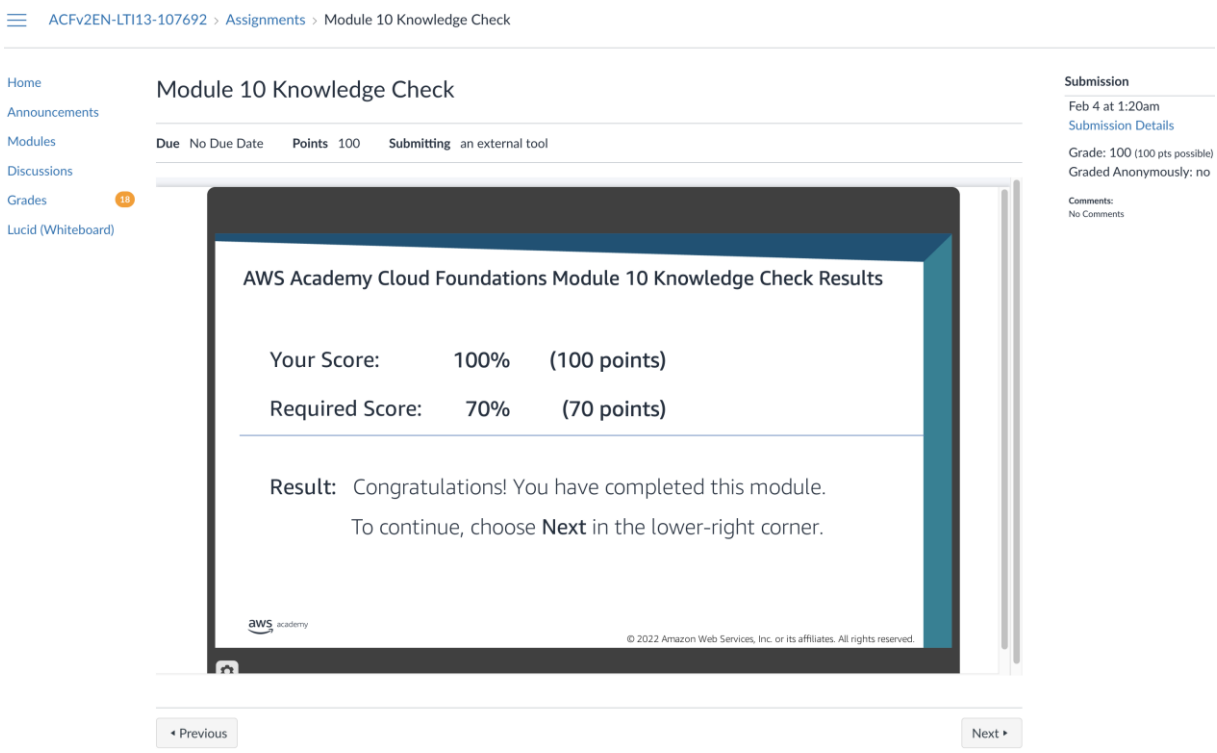
In this module, I learned how to use Elastic Load Balancing (ELB) to distribute traffic across Amazon EC2 instances, ensuring high availability and fault tolerance. I also explored how Amazon CloudWatch helps monitor AWS resources and applications in real-time. Additionally, I gained insights into how Amazon EC2 Auto Scaling dynamically adjusts the number of instances to match workload demands. I performed practical tasks related to scaling and load balancing to enhance system architecture.

Key Learnings:

1. Elastic Load Balancing (ELB): I learned that ELB automatically distributes incoming application traffic across multiple Amazon EC2 instances, helping to ensure the scalability and reliability of applications. It supports various load balancing algorithms and can handle large amounts of traffic efficiently.
2. Amazon EC2 Auto Scaling: I understood how Amazon EC2 Auto Scaling enables the automatic adjustment of the number of EC2 instances in response to traffic changes. This helps maintain application performance and reduces costs by optimizing resource usage

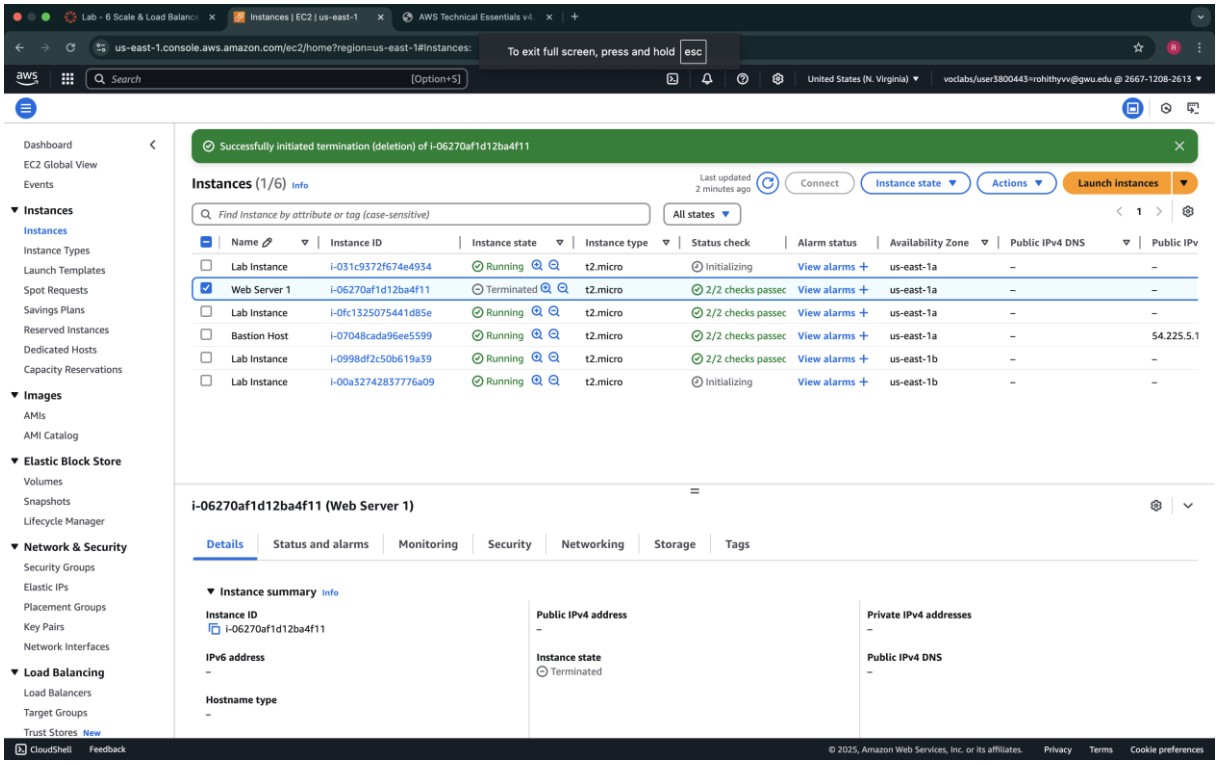
Knowledge Check Completion:

Fig. 15. Successful completion of knowledge test for Module 10



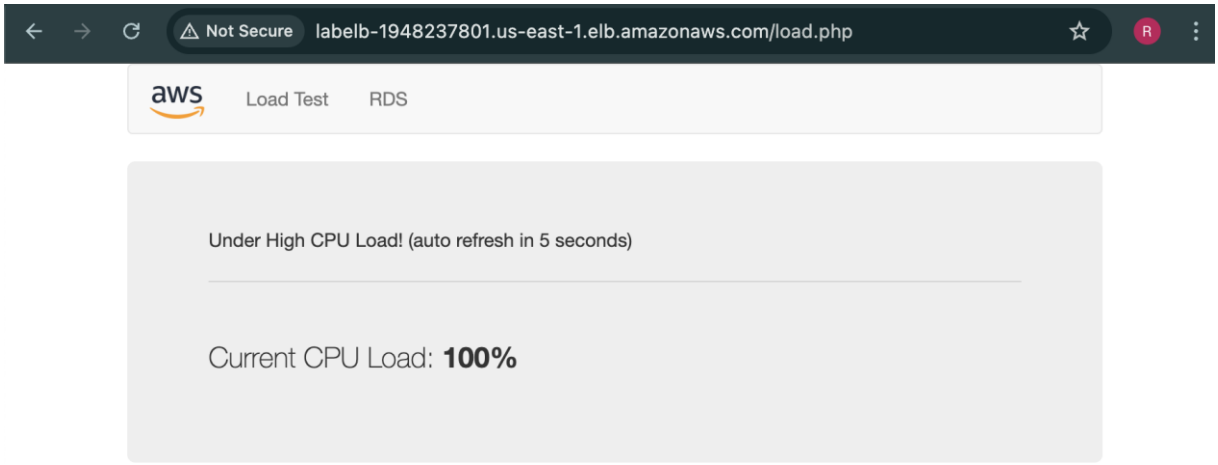
Note: AWS Academy Cloud Foundations Module 10 Knowledge Check passed with a perfect score of 100%.

Fig. 16.1 Lab 6 – Scale & Load Balance your Architecture



Note: created a load balancer that can balance traffic across multiple EC2 instances and Availability Zones.

Fig. 16.2 CloudWatch



Note: Created Alarms on CloudWatch. It has the CPU utilization chart indicating an increasing CPU percentage. Once it crosses the 60% line for more than 3 minutes, it will trigger Auto Scaling to add additional instances.

Conclusion:

The AWS course provided a strong foundation in essential skills and concepts, enabling a deeper understanding of cloud infrastructure, database management, and application development. It enhanced my practical knowledge of AWS tools and services for building scalable and efficient systems.

References:

Include citations in APA format for any external references used.

Amazon Web Services. (2022). AWS Academy Cloud Foundations. Retrieved from https://aws.amazon.com/training/awsacademy/

Bradley University. (2022). AWS Academy Cloud Foundations. Retrieved from https://www.bradley.edu/academic/continue/programs/aws-cloud-foundations/

Studocu. (2022). AWS Academy Cloud Foundations M0. Retrieved from https://www.studocu.com/row/document/innovation-academy/aws-academy-cloud-foundations/100-acclfo-20-en-m0sg-aws-academy-cloud-foundations-m0/116513417