Summary Report

The **AWS Academy Cloud Foundations Module 6: Compute** provides an overview of AWS compute services, focusing on **Amazon EC2**, **AWS Lambda**, **AWS Elastic Beanstalk**, and **container services** like **Amazon ECS** and **Amazon EKS**. Here’s a concise summary:

Key Topics Covered:

1. **Compute Services Overview**:

1. AWS offers various compute services, including **Amazon EC2** (virtual machines), **AWS Lambda** (serverless), **AWS Elastic Beanstalk** (PaaS), and container services like **Amazon ECS** and **Amazon EKS**.

2. **Amazon EC2**:

1. **EC2** provides resizable virtual machines in the cloud.
1. Key features: **Elasticity**, **scalability**, and **cost optimization**.
1. **Instance types** vary based on CPU, memory, storage, and networking needs.
1. **Security groups** act as firewalls, and **IAM roles** provide permissions.
1. **User data scripts** automate instance setup, and **EBS** provides durable storage.
1. **Pricing models**: On-Demand, Reserved, Spot, Dedicated Hosts, and Dedicated Instances.

3. **EC2 Cost Optimization**:

1. **Four pillars**: Right-sizing, increasing elasticity, optimal pricing models, and optimizing storage.
1. Use **Spot Instances** for cost savings and **Reserved Instances** for predictable workloads.

4. **Container Services**:

1. **Containers** package applications and dependencies for consistent deployment.
1. **Docker** is a popular container platform.
1. **Amazon ECS** orchestrates Docker containers, while **Amazon EKS** manages Kubernetes clusters.
1. **Amazon ECR** stores and manages Docker container images.

5. **AWS Lambda**:

1 **Serverless compute** service that runs code in response to events or schedules.

1 Pay only for compute time used.

1 Supports multiple programming languages and integrates with services like **S3**, **SNS**, and **CloudWatch**.

1 **Quotas**: Max memory allocation (10,240 MB), max runtime (15 minutes).

6. **AWS Elastic Beanstalk**:

1 **PaaS** for deploying and managing web applications.

1 Supports multiple platforms (Java, .NET, PHP, Python, Ruby, Go, Docker).

1 Automates deployment, scaling, and monitoring.

1 No additional charge; pay only for underlying resources.

Hands-On Activities:

1 **Lab 3**: Launch and manage an EC2 instance.

1 **Activity**: Compare EC2 vs. Amazon RDS for database deployments.

1 **AWS Lambda Activity**: Create a Lambda function to stop EC2 instances.

1 **Elastic Beanstalk Activity**: Deploy a web application.

Key Takeaways:

1 **Amazon EC2** is ideal for virtual machines with full control.

1 **AWS Lambda** is best for event-driven, serverless workloads.

1 **Elastic Beanstalk** simplifies web application deployment.

1 **Container services** (ECS, EKS) are suitable for containerized applications.

1 **Cost optimization** is crucial for managing AWS resources efficiently.

Additional Resources:

1 **Amazon EC2 Documentation**:
https://docs.aws.amazon.com/ec2/

1 **AWS Lambda Documentation**:
https://docs.aws.amazon.com/lambda/

1 **Elastic Beanstalk Documentation**: https://docs.aws.amazon.com/elastic-beanstalk/

1 **Cost Optimization Playbook**: https://d1.awsstatic.com/pricing/AWS_CO_Playbook_Final.pdf

This module equips learners with the knowledge to choose and manage the right AWS compute services for their needs.