DevOps and Cloud Based Software

Lab 1-2: Cloud Computing Foundation: Reporting Guidelines

University of Amsterdam

Objectives

- Understand the foundation of Cloud Computing
- Learn from the best industry practices in cloud services provisioning and management
- Get practical experience working with cloud services using AWS as an example of a cloud service provider

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Background

Learning Materials and Learning Platform

This assignment is based on educational and computing resources provided by the AWS Academy in their introductory course **Cloud Computing Foundation** on the AWS Academy Canvas platform. It contains lessons, learning materials, and a sandbox lab platform.

- Students are provided free accounts on the Canvas platform along with AWS educational lab sandbox access for course lessons and individual projects.
- Each student is granted **$100 USD credits** for the duration of the course.
  - **Note:** Students are advised to monitor their costs carefully and regularly.
- The course includes **Knowledge Check** assignments per module, with a minimum required successfully passed checks listed below.

Lab 2 Block 1: Cloud Computing Basics

To Complete the Assignment

Register and study the **AWS Cloud Foundation** course, completing at least the essential modules for the **DevOps course**, which you must report on:

Mandatory Modules:

1, 2, 4 (sections 1-3), 5 (sections 1-4), 6, 7

Optional Modules:

4 (sections 4-6), 5 (sections 5, 6), 8, 9, 10

Mandatory Labs:

1, 2, 3

Optional Labs (Highly Recommended):

4, 5

Lab 2 Block 2: Scaling and Monitoring

To Complete the Assignment

Use AWS Academy resources to perform the following tasks:

- Re-visit/study **Module 10: Auto Scaling and Monitoring**
- Perform **Lab 6**, including additional tasks to investigate **CloudWatch functionality**:
  - Monitor metrics and dashboard visualization, use of Alarms.
  - Select components and metrics to monitor.
  - Provide observations and suggestions for using cloud monitoring services in your project.

Reporting and Grading

Requirements for Successful Submission

1. **Knowledge Checking**
   - Successfully passed Knowledge Checks for **Modules 1, 2, 4, 6, 10**
   - Optional but highly advised: **Modules 5, 7**
2. **Practice/Labs: CloudWatch Monitoring Functionality**
   - Provide **2-3 screenshots** demonstrating the CloudWatch monitoring dashboard (e.g., Alarms, EC2 instances combined and individual).
   - Demonstrate **scaling up and scaling out** effects (increasing and decreasing the number of instances).
3. **Summary of Learning**
   - Summarize observations on **scalability and load balancing** (reaction and decommissioning time).
   - CloudWatch visualization and dashboard functions.
   - (Optional) Provide suggestions for using **CloudWatch functionality** in your project.
4. **Answer at least 3 Self-Study and Research Questions**
   - Expected answer length: **8-10 lines per question** (max **0.5 pages** per question, images optional).
5. **Provide a Summary of Learning**
6. **Submit Report to Canvas**

Self-Check/Self-Study Questions on Cloud Monitoring

1. What metrics would you use for your website serving as:
   - A webshop for a travel agency?
   - A streaming music website?
   - An environment monitoring server collecting sensor data?
2. What is the benefit of using a **dashboard** compared to individual service metrics?
3. What is an **Event Bus**? How can you use it with your application? What are its inputs and outputs?
4. What tools for **log collection and analysis** does AWS provide in addition to **CloudWatch**? What supporting services are involved? What are the costs of logging and analysis?
5. What is the use of **CloudWatch Alarms**? How are alarms related to metrics? What other AWS services can be used with alarms? (*Hint: Consider SNS and others.*)
6. Is **metrics collection** different for AMI/VMs, serverless/Lambda, and containerized applications?

AWS Academy Class Modules and Labs (For Reference)

Modules:

- **Module 1** - Cloud Concepts Overview
- **Module 2** - Cloud Economics and Billing
- **Module 3** - AWS Global Infrastructure Overview
- **Module 4** - AWS Cloud Security
- **Module 5** - Networking and Content Delivery
- **Module 6** - Compute
- **Module 7** - Storage
- **Module 8** - Databases
- **Module 9** - Cloud Architecture
- **Module 10** - Auto Scaling and Monitoring

Labs:

- **Lab 1** - Introduction to AWS IAM
- **Lab 2** - Build your VPC and Launch a Web Server
- **Lab 3** - Introduction to Amazon EC2
- **Lab 4** - Working with EBS
- **Lab 5** - Build a Database Server
- **Lab 6** - Scale & Load Balance your Architecture