DevOps and Cloud based software

Lab 02 Cloud Computing Foundation: Reporting guidelines

Intended learning outcomes

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

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 that contains lessons, learning materials, and sandbox lab platform.

- The students are provide free accounts on the Canvas platform together with the AWS educational lab sandbox that can be used both for course lessons and for individual projects
- Each student is granted with 100 USD credits for the duration of course
    - Note: Students are advised to control their cost carefully and regularly
- The course also contains Knowledge Check assignments per module. Minimum required successfully passed Knowledge Checks are listed below

Lab 2 Block 1: Cloud Computing basics

To complete assignment

Register and study the AWS Cloud Foundation course, passing at least modules essential for DevOps course on which you are required to report

- 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 but highly recommended 4, 5

Lab 2 Block 2: Scaling and Monitoring

To complete assignment

Use AWS Academy resource to perform the following tasks

- Re-visit/study Modules 10 - Auto Scaling and Monitoring
- Perform Lab 6 with additional tasks to investigate CloudWatch functionality
    - Monitoring metrics and dashboard visualization, use of Alarms
    - Selection of components and metrics to monitor
    - Observations and suggestions to use cloud monitoring services in your project

Reporting and grading

The following are the requirements for successful reporting of Assignment 02

1) Knowledge checking with successfully passed
    - Mandatory Knowledge checks for modules 1, 2, 4, 6, 10
    - Optional but highly advised 5, 7
2) Practice/Labs CloudWatch monitoring functionality (see Block 2 – Monitoring): provide 2-3 screenshots demonstrating CloudWatch monitoring dashboard, e.g. Alarms, EC2 instances combined and individual
    - Demonstrate scaling up and scaling out effect (increasing and decreasing number of instances)
3) Provide summary of what you learned, problems experienced and solved
    - Summarise observation on scalability and load balancing: what is the reaction and decommissioning time
    - CloudWatch visualization and dashboard functions
    - Optionally, you can provide suggestions how would you use the CloudWatch functionality in your project
4) Answer at least 3 self-study and research questions (See below). Expected length of answers – min 8-10 lines of text, however not more than 0.5 pages per question (with optional images if needed).
5) Provide a summary of what you have learned
6) Submit your report to Canvas

Self-check/self-study questions on Cloud monitoring

1. What metrics would you use for your website serving as (1) a webshop for travel agency or (2) streaming music website or (3) environment monitoring server collecting information from environmental sensors.

2. What is the benefit of using the dashboard comparing to individual services metrics?

3. What is an Event Bus? How can you use it with your application? What is the input and output of Event Bus?

4. What tools for log collection and analysis are provided by AWS, in addition to CloudWatch? What supporting services are involved? Does it cost to log and analyse?

5. What is the use of CloudWatch Alarms? How alarms are related to metrics? What other AWS services are used (or can be used) with Alarms? Hint: Consider SNS, look for others.

6. Is metrics collection different for AMI/VMs, serverless/Lambda, and containerised applications?

List of AWS Academy class Modules and Labs (for reference)

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

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