



Strathmore
UNIVERSITY

SCHOOL OF COMPUTING AND ENGINEERING SCIENCES (SCES)
BACHELOR OF SCIENCE IN COMPUTER NETWORKS AND CYBER SECURITY &
BUSINESS INFORMATION TECHNOLOGY
END-OF-SEMESTER EXAMINATION
CNS4105 & BBT4303: CLOUD COMPUTING

DATE: 16/8/2023

Time: 2 Hours

Instructions

1. This examination consists of **FIVE** questions.
2. Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.

Question One [30 Marks]

- A. Cloud computing brings open issues regarding the security and privacy of outsourced data. Discuss how the vulnerable programming interfaces and the distributed technology vulnerabilities can be the major threats to cloud adoption and utilization. **[6 Marks]**
- B. Scalability in load balancing is the ability of a load balancer to continue to distribute workload across any finite number of servers. Consider the design of the interactive three-tier web application load-balancing algorithm with the load-balancing layer, the domain layer with the applications and the web servers, and the data layer with database servers and data stores. Using a diagram, illustrate the architecture. **[12 Marks]**
- C. Explain the three main cloud deployment models and give an example of each model. **[6 Marks]**
- D. The three types of S3 server-side encryption offered by Amazon Web Services are SSE-C, SSE-KMS, and SSE-S3. Briefly explain how these encryption types are implemented in a cloud environment. **[6 Marks]**

Question Two [15 Marks]

- A. Illustrate using diagrams the types of virtualization required in servers and desktop computers. Give examples of each type of virtualization software. **[10 Marks]**
- B. Discuss five points you will consider while choosing between private cloud and public cloud. Explain the reasons behind your selection criteria. Provide examples. **[5 Marks]**

Question Three [15 Marks]

- A. Explain the four pillars of cost optimization in Amazon EC2 pricing. **[8 Marks]**
- B. Discuss any four essential characteristics of cloud computing. **[7 Marks]**

Question Four [15 Marks]

- A. Consider the AWS Identity and Access Management (IAM) deployment in Figure 2. Explain any four IAM role characteristics. **[8 Marks]**

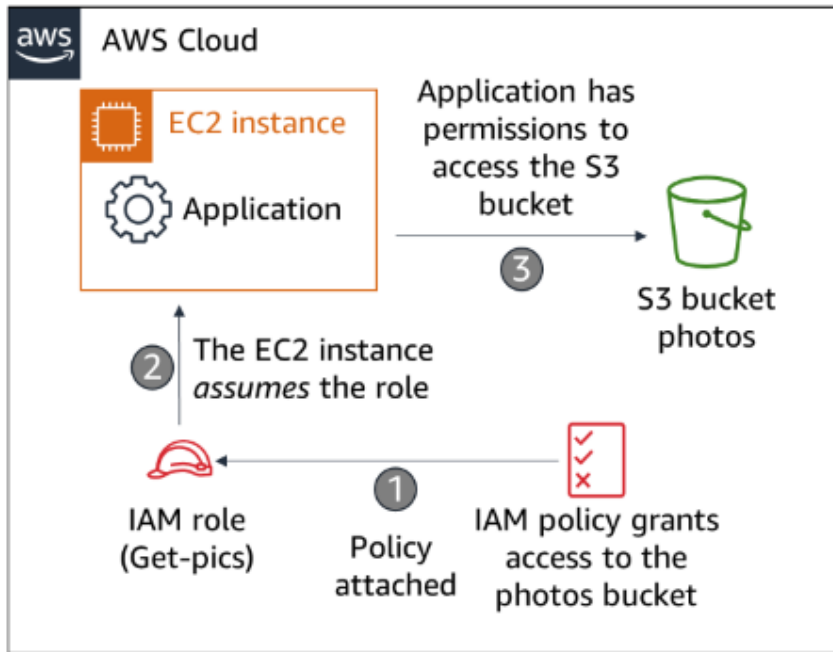


Figure 2: IAM Deployment

- B. AWS and other global cloud vendors implement regions and availability zones are part of their global infrastructure. Using concrete examples, differentiate between regions and availability zones. **[7 Marks]**

Question Five [15 Marks]

- A. Explain the difference between Public, Private, Hybrid, and Community Clouds. **[8 Marks]**
- B. Giving relevant examples, explain the following objectives of cloud computing. **[7 Marks]**
- Controllability
 - Auditability
 - Visibility