

Question Collection

Cloud Application and Development Foundation

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Questions

Unit I: Introduction

1. Explain the concepts of distributed computing, collaborative computing, and cloud computing. Describe the differences between them in terms of their architecture and typical applications.
2. Explain the three service models of cloud computing (IaaS, PaaS, SaaS) with suitable examples.
3. What is cloud architecture? Illustrate with a diagram the components involved in a typical cloud infrastructure.
4. Compare traditional computing models with cloud computing. Highlight the advantages and challenges of migrating to the cloud.
5. Describe the key characteristics of cloud computing as defined by NIST.
6. What are the different types of cloud storage solutions? Give real-world use cases for each type.
7. Explain the concept of multi-tenancy in cloud environments and its security implications.
8. How do cloud services support industrial applications? Provide at least two case studies.
9. Discuss the role of virtualization in enabling cloud computing.
10. What are the major deployment models in cloud computing? Differentiate between public, private, hybrid, and community clouds.

UNIT II: Cloud Service Administration

1. Explain the importance of monitoring in cloud environments. List some tools used for monitoring cloud systems.

2. Differentiate between metrics, logs, and traces in cloud monitoring. When would you use each?
3. What is auto-scaling in cloud infrastructure? Explain its types and benefits.
4. Describe the shared responsibility model in cloud security. How does it apply to AWS, Azure, and GCP?
5. Explain how Identity and Access Management (IAM) enhances security in cloud platforms.
6. What are environment variables in cloud applications? Why are they important for secure and flexible deployments?
7. Discuss resource allocation strategies in cloud environments. Compare static vs dynamic allocation.
8. What are the best practices for cost optimization in cloud resource management?
9. How can load balancing improve performance and availability in cloud applications? Mention common algorithms used.
10. Describe the process of setting up auto-scaling for a web application using AWS or Azure.

UNIT III: Applications in the Cloud

1. What is a web application framework, and how is it utilized in cloud-based application development?
2. Compare Django, Flask, and Node.js in terms of their deployment complexity and scalability in cloud environments.
3. How do Platform-as-a-Service (PaaS) solutions simplify the deployment and scaling of web applications in the cloud?
4. Explain how web applications are deployed in cloud environments. What roles do PaaS and serverless models play?
5. What are cloud web hosting services, and how do they differ from traditional hosting approaches?

6. Compare shared hosting, VPS hosting, and cloud hosting in terms of cost, scalability, and reliability.
7. What is the function of services like AWS Elastic Beanstalk and Google App Engine in cloud-based web hosting?
8. What are cloud APIs, and how do they enable communication between cloud services and applications?
9. Compare RESTful APIs and GraphQL APIs in terms of flexibility, performance, and data handling in microservices.
10. How do cloud provider APIs like AWS SDK and Google Cloud API support automation of resource management?
11. Explain how APIs enable communication and integration between microservices in a cloud-native architecture.
12. What is DevOps, and how does it contribute to efficient and continuous software delivery in the cloud?
13. Discuss the core principles of DevOps and their connection to continuous integration and continuous delivery (CI/CD).
14. Name and describe key DevOps tools used in cloud CI/CD workflows, such as Jenkins, GitLab CI, and GitHub Actions.
15. What are the main stages of a CI/CD pipeline, and how do they improve the software deployment process?
16. Design a simple CI/CD workflow for a Node.js application using GitHub Actions or a similar tool.
17. Explain the basic Git workflow, including commands like init, add, commit, and push.
18. What is branching in Git, and how does it support collaboration? How are merge conflicts resolved?
19. What is containerization, and how does it differ from traditional virtualization in cloud environments?
20. Describe how Docker containers are used and discuss how it helps us to ensure scalability in cloud-native deployments.

UNIT IV: Data Management in the Cloud

1. What are the core principles of cloud data security? Explain confidentiality, integrity, and availability in this context.
2. What are the main challenges of ensuring data security in a cloud environment, and how can they be addressed?
3. Why is data location important in cloud computing, and how do data sovereignty laws impact it?
4. Explain the concept of data control in the cloud. How can organizations maintain control over their data when using third-party cloud providers?
5. What are the key characteristics of large-scale data processing in the cloud, and which technologies are commonly used (e.g., Hadoop, Spark)?
6. Compare batch processing and stream processing in cloud-based large-scale data workflows.
7. Describe the CAP theorem and its relevance in designing NoSQL databases.
8. What are the key considerations when choosing the geographic location of cloud-stored data?
9. Explain the difference between relational and NoSQL databases. When would you choose Amazon RDS over DynamoDB?
10. What is data sharding? Explain how MongoDB uses sharding for scalability.
11. Describe the concept of data archival in cloud environments. What are the available storage tiers?
12. What is data archival in cloud computing, and how is it different from regular backups? List some use cases and services used for archiving (e.g., AWS Glacier).
13. Explain the role of caching (e.g., Redis) in improving database performance in the cloud.
14. What are the best practices for managing access control and permissions in cloud data systems?

15. How do cloud providers like AWS, Azure, and GCP ensure compliance with GDPR and HIPAA?

UNIT V: Cloud Computing Standards

1. What are the major standards organizations involved in cloud computing? Briefly describe their roles.
2. Explain the NIST Cloud Computing Reference Architecture. What are its main components?
3. What is interoperability in cloud computing? Why is it essential in multi-cloud environments?
4. Discuss the importance of portability in cloud computing. How can containerization and Kubernetes help achieve it?
5. What is TOSCA and how does it support cloud portability?
6. Describe the Open Cloud Computing Interface (OCCI) and its role in ensuring interoperability.
7. Explain the differences between API-based, event-driven, and message-based integration patterns in cloud systems.
8. What are the Cloud Security Alliance's (CSA) Cloud Controls Matrix (CCM) and STAR certification?
9. Discuss the ISO/IEC 27017 standard and its relevance to cloud security.
10. How do cloud security frameworks help organizations comply with regulations like GDPR and HIPAA?

UNIT VI: Cloud Platforms – AWS, GCP, and Azure

1. Compare AWS, GCP, and Azure in terms of services offered, pricing models, and use cases.
2. Explain the role of Identity and Access Management (IAM) in AWS, GCP, and Azure. How do they differ?
3. What is AWS EC2? How is it used for launching and managing virtual machines?
4. Describe the Google Compute Engine (GCE) and how it compares to AWS EC2.

5. Explain how to configure an Azure Virtual Machine using the Azure CLI.
6. What are the command-line tools used in AWS (CLI), GCP (gcloud), and Azure (Azure CLI)? Provide sample commands.
7. Compare the IAM structures of AWS, GCP, and Azure. Which offers finer-grained access control?
8. How do AWS, GCP, and Azure handle network isolation through VPCs or similar constructs?
9. Describe the process of setting up a basic instance in AWS, GCP, and Azure.
10. Discuss the role of managed services (like AWS Lambda, GCP Functions, Azure Functions) in modern cloud architectures.