University Question Bank

A comprehensive compilation of important questions

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Questions and Answers

> 1. Explain Software as a service.

Software as a Service (SaaS)

What is Software as a Service (SaaS)?

SaaS refers to a software delivery model in which a third-party provider hosts an application or software and makes it available to users over the internet.

In a SaaS model, the provider manages the underlying infrastructure, including hardware, software, and maintenance, allowing users to access the application from anywhere, on any device with an internet connection.

This model has several benefits, including reduced maintenance and update burdens, increased scalability, and improved collaboration and communication among team members.

Examples of SaaS applications include email services like Gmail and Outlook, productivity software like Microsoft Office 365, and customer relationship management (CRM) software like Salesforce.

Key Characteristics of SaaS:

- **Access via internet connection**: Users access the software application over the internet, eliminating the need for local installation.
- **Third-party hosting**: The provider hosts and manages the software application, taking care of infrastructure and maintenance tasks.
- **Rapid deployment**: Users can quickly and easily access the software application, without the need for complex installation processes.
- **Scalability**: SaaS applications can quickly scale to meet changing business needs, without the need for significant hardware or infrastructure upgrades.

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> 2. Identify the main security threats for the SaaS cloud delivery model on a public cloud.

When it comes to SaaS on a public cloud, the main security threats include:

- Data breaches: unauthorized access to sensitive data.
- Malware and viruses: malicious software that can compromise the confidentiality, integrity, and availability of data.
- Data loss: accidental deletion or corruption of data.

- Denial of Service (DoS) and Distributed Denial of Service (DDoS) attacks: intentional attempts to overload the system and make it unavailable.
- Insufficient access controls: lack of proper authentication and authorization procedures.

It is essential to have a robust security plan in place to mitigate these threats, including firewalls, intrusion detection and prevention systems, encryption, and regular software updates.

3. Describe the fundamental features of the economic and business model behind cloud computing.

The fundamental features of the economic and business model behind cloud computing include:

- Scalability: ability to scale up or down according to demand.
- Elasticity: ability to quickly adjust capacity to changing workloads.
- On-demand self-service: users can request and provision resources without human intervention.
- Multi-tenancy: multiple customers can share the same infrastructure, improving resource utilization and reducing costs.

This model is designed to provide customers with greater flexibility, reduced costs, and improved scalability, allowing them to focus on their core business while leaving the infrastructure management to the cloud provider.

4. Describe Amazon EC2 and its basic features.

Amazon Elastic Compute Cloud (EC2) is a web service that provides scalable computing capacity in the cloud. EC2 allows users to spin up

virtual machines (instances) with various configurations, such as CPU, memory, and storage, to run applications and services.

The basic features of Amazon EC2 include:

- On-demand instance creation: users can create instances as needed, with the option to specify the instance type, operating system, and storage.
- Scalability: instances can be scaled up or down as needed to match changing workloads.
- Isolation: instances are isolated from each other by default, ensuring that each instance runs in a unique virtual environment.
- Scheduler: users can choose from a variety of schedulers to manage instance startup, shut down, and reboot.

5. Describe the core components of App Engine. 1

Google App Engine is a platform-as-a-service (PaaS) that enables developers to build scalable and high-availability applications. The core components of App Engine include:

- Apps: a web application written in a supported programming language (e.g., Python, Java, PHP). Each app is isolated from others and runs in its own virtual environment.
- Services: a set of scalable services that run within the App Engine environment, including:
    - Datastore: a NoSQL database for storing data.
    - Task queue: a distributed task queue for executing tasks asynchronously.
    - Memcache: a caching service for storing frequently accessed data.

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> 6. Compare the benefits and the potential problems due to virtualization on public, private, and hybrid clouds.

Virtualization is the foundation of cloud computing, allowing multiple virtual machines (VMs) to run on a single physical host. The benefits of virtualization on public, private, and hybrid clouds include:

- Scalability: virtualization enables easy scaling up or down of resources as needed.
- Elasticity: virtualization allows for flexible allocation of resources, making it easy to adjust capacity to changing workloads.
- Security: virtualization provides a layer of abstraction between physical hardware and VMs, making it easier to secure VMs and data.

However, there are also potential problems to consider:

- Resource contention: multiple VMs competing for limited resources can lead to performance issues.
- Overprovisioning: allocating more resources than needed can lead to wasted resources and increased costs.
- Underprovisioning: allocating too few resources can lead to performance issues and decreased productivity.

7. What are the main characteristics of a PaaS.

PaaS (Platform-as-a-Service) is a cloud computing model that provides a complete platform for developing, running, and managing applications. The main characteristics of a PaaS include:

- Infrastructure: the PaaS provider manages the underlying infrastructure, including servers, storage, and networking.
- Platform: the PaaS provider provides a complete platform for development, including programming languages, tools, and libraries.
- Applications: users can deploy and run applications on the PaaS without worrying about the underlying infrastructure.

This model is designed to simplify application development and deployment, allowing developers to focus on writing code rather than managing infrastructure.

8. What are the differences between Amazon Simple DB and Amazon RDS?

Amazon Simple DB and Amazon RDS are both database services offered by AWS, but they serve different purposes:

- Amazon Simple DB:
    - Suitable for large-scale web applications requiring high availability and scalability.
    - Provides a simple, schema-less NoSQL database for storing structured and semi-structured data.
- Amazon RDS:
    - Suitable for relational databases and applications requiring a traditional database management system.
    - Supports a wide range of database engines, including MySQL, PostgreSQL, Oracle, and Microsoft SQL Server.

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9. How does cloud computing help to reduce the time to market applications and to cut down capital expenses.

Cloud computing helps to reduce the time to market applications and cut down capital expenses in several ways:

- Increased scalability: cloud resources can be spun up and down as needed, allowing for faster deployment and reduced lead times.
- Reduced capital expenses: cloud computing eliminates the need for upfront capital expenditures on hardware and software, reducing the financial burden on businesses.

- Improved agility: cloud computing enables rapid provisioning and deployment of resources, allowing businesses to quickly respond to changing market conditions.

10. What are the development technologies currently supported by App Engine?

Development Technologies Supported by App Engine:

- *Programming Languages:* Python 2.7, 3.7, and 3.8
- *Frameworks:* Django, Flask, Pyramid, and webapp2
- *Scripting Languages:* Ruby, PHP, and Go
- *Version Control Systems:* Git and Mercurial
- *Datastore Query Languages:* Python, Java, and XML
- *Cloud Endpoints Frameworks:* Java, Python, and Go

: The list of supported technologies is subject to change over time and may be exhaustive. It is always recommended to check the official Google Cloud documentation for the most up-to-date information.