University Question Bank

A comprehensive compilation of important questions

Table of Contents

Questions and Answers

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

When using a Software as a Service (SaaS) cloud delivery model on a public cloud, there are several main security threats to be aware of. Some of these threats include:

- Data breaches: Sensitive data stored in the cloud can be accessed by unauthorized users, potentially leading to data breaches.
- Data loss: If the cloud provider experiences a hardware failure or natural disaster, data may be lost or corrupted.

- Unsecured data transmission: Data transmitted between the user's device and the cloud may be intercepted or tampered with, compromising its integrity.
- Insufficient access controls: Inadequate access controls can allow unauthorized users to access or modify data, applications, or infrastructure.
- Denial of Service (DoS) attacks: Cloud-based services can be targeted by DoS attacks, which can cause system crashes or slow performance.

It is essential to implement robust security measures, such as authentication, authorization, and encryption, to mitigate these risks and ensure the security and integrity of data in the cloud.

2. What are the main characteristics of a PaaS.

What are the main characteristics of a PaaS?

PaaS, or Platform as a Service, is a cloud computing model that enables users to deploy, manage, and run their applications on a third-party-run platform. The main characteristics of a PaaS are as follows:

- **Self-Service Provisioning**: PaaS providers offer self-service portals that allow users to provision and manage their own applications, without the need for manual intervention or IT involvement.
- **Multitenancy**: PaaS platforms are designed to support multiple tenants or users, each with their own isolated environment, while sharing the underlying infrastructure and resources.
- **Software Abstraction**: PaaS providers manage the underlying operating system, middleware, and runtime environments, abstracting these complexities from the user. This allows users to focus on developing their applications, rather than worrying about the underlying infrastructure.
- **Scalability**: PaaS platforms are designed to scale automatically, based on demand, to ensure that applications

can handle increased traffic and usage without being affected by infrastructure bottlenecks.
  - **Automatic Maintenance**: PaaS providers are responsible for maintaining the underlying infrastructure, including patching, updating, and backing up the system, freeing up users to focus on their applications.**
  - **Integration with Other Cloud Services**: PaaS platforms often provide seamless integration with other cloud services, such as IaaS and SaaS, allowing users to build hybrid applications that combine the benefits of different cloud models.**
  - **Security and Compliance**: PaaS providers are responsible for ensuring the security and compliance of the platform and applications, including data encryption, access control, and regulatory compliance.**
  - **Persistent Storage**: PaaS platforms typically provide persistent storage options, allowing users to store and retrieve their data reliably and efficiently.**
  - **Development Tools and Frameworks**: PaaS providers often provide a range of development tools and frameworks, such as integrated development environments (IDEs), code editors, and build tools, to support application development and deployment.**
  - **Cost Transparency**: PaaS providers typically offer cost-transparent pricing models, with clear and predictable costs for usage, making it easier for users to budget and plan for their cloud resources.**

: This is just a sample answer and you can modify it according to your requirements. Also, you can add your own style and format to make it more visually appealing.

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

Virtualization is a key technology used in cloud computing, allowing multiple virtual servers to run on a single physical server. Here is a comparison of the benefits and potential problems of virtualization across public, private, and hybrid clouds:

- High scalability
- Low upfront costs
- On-demand computing resources

- Data security concerns
- Lack of control over infrastructure
- Dependence on cloud provider

- Ultimate control over infrastructure
- High security
- Predictable costs

- High upfront costs
- Limited scalability
- Complexity in maintenance

- Combines the benefits of public and private clouds
- Flexibility and scalability
- Ability to migrate workloads

- Increased complexity
- Potential security risks
- Likely to require additional management tools

While virtualization offers numerous benefits in cloud computing, it is essential to carefully consider the potential problems and choose the right cloud solution for your organization's needs.

4. Describe Amazon EC2 and its basic features.

Amazon Elastic Compute Cloud (EC2) is a web service provided by Amazon Web Services (AWS) that allows users to launch and manage virtual machines, called instances, in the cloud. EC2 provides a highly scalable and flexible computing environment that can be used for a wide range of applications and workloads. The basic features of Amazon EC2 include:

- Virtual Machines: EC2 allows users to launch and manage multiple virtual machines, each with its own operating system, in the cloud.
- Choose the Hardware: EC2 provides a range of instance types, each with varying levels of processing power, memory, and storage, allowing users to choose the right hardware for their needs.
- Choose the Operating System: EC2 allows users to choose from a wide range of operating systems, including Windows, Linux, and more.
- Scalability: EC2 instances can be scaled up or down as needed, making it easy to adapt to changing workloads.
- Security: EC2 provides a range of security features, including network access controls, firewall rules, and encryption.

By providing a highly scalable and flexible computing environment, Amazon EC2 has become a popular choice for cloud-based computing and is widely used by businesses and developers around the world.

5. Describe the core components of App Engine. 1

Google App Engine is a cloud-based platform for building scalable web applications. The core components of App Engine include:

- App Engine Services: App Engine provides a range of services, including Datastore for storing structured and unstructured data, Memcache for caching data, and Tasks for running background tasks.
- Models, Views, and Controllers: App Engine uses the Model-View-Controller (MVC) pattern for building web applications, where models represent data, views represent the user interface, and controllers handle user input.

- Request Handlers: App Engine uses request handlers to process incoming requests and generate responses.
- Datastore: App Engine's Datastore is a NoSQL database that provides a scalable and scalable way to store and retrieve data.
- CRUD (Create, Read, Update, Delete) Operations: App Engine provides support for CRUD operations, making it easy to interact with the Datastore.

By providing a scalable and flexible platform for building web applications, App Engine has become a popular choice for developers and is widely used for building a wide range of applications.

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

Cloud computing can help reduce the time-to-market for applications in several ways:

- Faster Deployment: Cloud computing allows for fast and easy deployment of applications, reducing the time and effort required to get applications up and running.
- Agility: Cloud computing provides a highly agile environment, allowing developers to quickly respond to changing market conditions and customer needs.
- Scalability: Cloud computing provides scalability, allowing applications to scale up or down as needed, reducing the risk of over-provisioning or under-provisioning.

Additionally, cloud computing can help reduce capital expenses by:

- Reducing Infrastructure Costs: Cloud computing eliminates the need for upfront infrastructure investments, reducing capital expenses.
- Removing Maintenance Responsibilities: Cloud computing providers handle maintenance tasks, such as software updates and patches, reducing the need for in-house expertise and resources.

- Providing Pay-As-You-Go Pricing: Cloud computing provides a pay-as-you-go pricing model, allowing users to only pay for the resources they use, reducing waste and unnecessary expenses.

By providing a flexible, agile, and scalable environment, cloud computing can help reduce the time-to-market for applications and cut down capital expenses, allowing organizations to focus on innovation and growth.

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

Google App Engine supports a wide range of development technologies, including:

- Java: App Engine provides support for Java development, including Java 7 and Java 8.
- Python: App Engine provides support for Python development, including Python 2.7 and Python 3.7.
- Go: App Engine provides support for Go development.
- Node.js: App Engine provides support for Node.js development.
- PHP: App Engine provides support for PHP development.
- Ruby: App Engine provides support for Ruby development.
- Python frameworks: App Engine provides support for popular Python frameworks such as Django and Flask.

By supporting a wide range of development technologies, App Engine provides developers with the flexibility to choose the technology that best suits their needs and expertise.

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

Differences between Amazon Simple DB and Amazon RDS:

Amazon SimpleDB and Amazon RDS (Relational Database Service) are both database services offered by Amazon Web Services (AWS), but they serve different purposes and have distinct characteristics.

- **Purpose:** Amazon SimpleDB is a fast and flexible NoSQL database service that allows customers to store and query large amounts of data with high availability and reliability. Amazon RDS, on the other hand, is a relational database service that allows customers to run and manage relational databases in the cloud.
- **Data Model:** Amazon SimpleDB uses a schema-less data model, which means that customers can add or remove attributes from their data as needed. Amazon RDS uses a traditional relational data model, with tables, rows, and columns.
- Amazon SimpleDB uses a proprietary query language called AWSQuery, which is designed for fast and efficient querying of large datasets. Amazon RDS supports standard SQL queries, making it compatible with a wide range of relational databases and tools.
- **Both services are highly scalable, but Amazon SimpleDB is designed to handle large amounts of data and queries with ease, making it a good choice for big data and analytics workloads. Amazon RDS is designed to scale with the needs of a growing application, but may require more tuning and management.**
- Amazon SimpleDB provides built-in support for many programming languages and frameworks, including .NET, Java, and Ruby. Amazon RDS supports a wide range of relational databases, including MySQL, PostgreSQL, Oracle, and SQL Server.

  (Source: Amazon Web Services) This answer is formatted with headings, bullet points, and paragraph breaks for easy reading. The HTML tags used include `` **for bold text, `**

  ` **for paragraphs, and** `
- ` **for lists.**

9. Explain Software as a service.

Software as a Service (SaaS) is a cloud computing model in which software applications are hosted and managed by a third-party provider, and made available to users over the internet. SaaS is also known as "on-demand software" or "software on-demand".

The key characteristics of SaaS include:

- Subscription-based model: Users pay a subscription fee to access the software application.
- Hosted and managed by a third-party provider: The provider is responsible for hosting and managing the software application, including maintenance, updates, and backups.
- Accessible over the internet: Users can access the software application from anywhere, at any time, using a web browser or mobile device.
- Multitenant architecture: The software application is designed to support multiple customers, with each customer's data and configuration stored separately.

SaaS provides a number of benefits to users, including increased flexibility, reduced upfront costs, and improved scalability. However, it also presents some security and control risks, as users are reliant on the provider to manage and maintain the software application.

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

The economic and business model behind cloud computing is based on a subscription-based service delivery model, where customers pay for the resources they use, rather than having to purchase and maintain physical infrastructure themselves. The key features of this model include:

- Pay-As-You-Go Pricing: Customers only pay for the resources they use, rather than having to pay for a fixed amount of capacity.

- Subscription-Based Model: Customers pay a recurring subscription fee for access to the cloud services, rather than having to purchase the services upfront.
- Multi-Tenancy: The cloud provider supports multiple customers, with each customer's data and configuration stored separately, to increase resource utilization and reduce costs.
- Economies of Scale: Cloud providers can achieve economies of scale by hosting multiple customers on a single infrastructure, reducing their costs and allowing them to pass the savings on to their customers.

The economic and business model behind cloud computing is designed to provide customers with a flexible and scalable way to access the resources they need, while also providing cloud providers with a predictable and scalable business model.