**CCS335-CLOUD COMPUTING**

**PART A**

**UNIT-I CLOUD ARCHITECTURE MODELS AND INFRASTRUCTURE**

1. **What is Cloud Computing?**

Cloud computing is the delivery of computing services over the internet, including storage, processing power, and software applications, on a pay-as-you-go basis. It allows users to access and use resources without owning or managing physical hardware.

1. **What is P2P network?**

A Peer-to-Peer (P2P) network is a decentralized network where each participant (peer) has equal privileges and responsibilities. Peers directly share resources, such as files or computing power, without relying on a central server.

1. **What is Community Cloud?**

Community Cloud is a cloud infrastructure shared by several organizations with common concerns, such as security, compliance, or performance requirements. It can be managed by the organizations or a third party and can be hosted on-premises or off-premises.

1. **Difference between Grid and Cloud Computing?**

* Grid Computing: Focuses on sharing resources across multiple independent systems to solve large-scale computational problems.
* Cloud Computing: Provides scalable and on-demand resources over the internet, offering flexibility and pay-per-use pricing models.

1. **What is CSB?**

Cloud Service Brokerage (CSB) is an intermediary service that helps organizations select, manage, and integrate multiple cloud services. A CSB acts as a broker to optimize the use of cloud resources and ensure seamless integration.

1. **Explain SOA with its applications?**

Service-Oriented Architecture (SOA) is an architectural pattern where software components (services) are reusable, interoperable, and loosely coupled. SOA facilitates the integration of diverse applications and systems. Applications of SOA include business process integration, enterprise application integration, and enabling web services.

1. **Differentiate HPC and HTC?**

* High-Performance Computing (HPC): Focuses on solving complex computational problems requiring high processing power, often used in scientific research and simulations.
* High-Throughput Computing (HTC): Aims to complete a high number of tasks over a long period, commonly used in data analysis and processing large datasets.

1. **What is the difference between parallel and distributed computing?**

* Parallel Computing: Involves dividing a single task into smaller sub-tasks that run simultaneously on multiple processors within a single system.
* Distributed Computing: Involves distributing tasks across multiple interconnected systems, each working on a part of the task independently.

1. **What is a Cloud Provider?**

A cloud provider is a company that offers cloud computing services, such as infrastructure, platforms, and software, to customers over the internet. Examples include Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP).

1. **List some Examples of Private Cloud.**

Examples of private cloud platforms include VMware vSphere, OpenStack, and Microsoft Azure Stack. These platforms enable organizations to build and manage their own cloud infrastructure within their data centers.

**UNIT-II VIRTUALISATION BASICS**

PART-A

1.**What is a Virtual Machine?**

A virtual machine (VM) is a software emulation of a physical computer that runs an operating system and applications. VMs provide the same functionality as physical machines but with greater flexibility and efficiency.

2.**What is the Taxonomy of Virtual Machines?**

The taxonomy of virtual machines classifies VMs into two categories: system virtual machines, which emulate entire physical machines, and process virtual machines, which execute individual processes in a virtual environment.

3.**What is a Hypervisor?**

A hypervisor, also known as a virtual machine monitor (VMM), is software that creates and manages multiple VMs on a single physical host. It allows VMs to share hardware resources while maintaining isolation between them.

4.**What are Key Concepts in Virtualization?**

Key concepts in virtualization include abstraction, isolation, encapsulation, and multiplexing. These concepts enable the efficient use of physical resources and the creation of isolated virtual environments.

5.**What is Virtualization Structure?**

Virtualization structure refers to the architecture of virtualization environments, including the hypervisor, host machine, guest VMs, and virtual resources such as virtual CPUs, memory, and storage.

6.**What are Implementation Levels of Virtualization?**

Virtualization can be implemented at various levels, including hardware-level virtualization, operating system-level virtualization, and application-level virtualization. Each level offers different degrees of flexibility and resource isolation.

7.**What is Full Virtualization?**

Full virtualization is a type of virtualization where the hypervisor provides complete emulation of the underlying hardware, allowing unmodified guest operating systems to run in isolated VMs.

8.**What is Para Virtualization?**

Para virtualization is a type of virtualization where the guest operating system is modified to work in cooperation with the hypervisor, resulting in improved performance by reducing the overhead of emulation.

9.**What is Hardware Virtualization?**

Hardware virtualization involves using specialized hardware features, such as Intel VT-x or AMD-V, to support virtualization. These features enable more efficient creation and management of VMs by offloading certain tasks to the hardware.

10.**What is Virtualization of CPU?**

Virtualization of the CPU allows multiple VMs to share the physical CPU resources of the host machine. The hypervisor schedules and allocates CPU time to each VM, ensuring fair and efficient use of the CPU.

**UNIT-III VIRTUALIZATION INFRASTRUCTURE AND DOCKER**

PART-A

1.**What is Desktop Virtualization?**

Desktop virtualization is a technology that separates the desktop environment and associated application software from the physical client device, allowing users to access their desktops from any device over a network.

2.**What is Network Virtualization?**

Network virtualization is the process of combining hardware and software network resources and network functionality into a single, software-based administrative entity. This allows for the creation of multiple virtual networks that can coexist on the same physical infrastructure.

3.**What is Storage Virtualization?**

Storage virtualization is the pooling of physical storage from multiple storage devices into what appears to be a single storage device, managed from a central console. It simplifies storage management and optimizes utilization.

4.**What is System-level Operating Virtualization?**

System-level operating virtualization, also known as operating system virtualization, involves running multiple virtual machines on a single physical machine, with each VM operating independently and running its own operating system.

5.**What is Application Virtualization?**

Application virtualization is a technology that encapsulates applications from the underlying operating system, allowing them to run in isolated environments. This eliminates application conflicts and simplifies deployment.

6.**What are Virtual Clusters and Resource Management?**

Virtual clusters are groups of interconnected virtual machines that work together as a single computing resource. Resource management involves the allocation and optimization of computing resources to ensure efficient operation and performance of virtual clusters.

7.**What is the difference between Containers and Virtual Machines?**

* + Containers: Lightweight, portable, and efficient; share the host OS kernel, with isolated user-space instances.
  + Virtual Machines: Heavyweight; each VM includes a full OS instance, making them more resource-intensive compared to containers.

8.**What is Docker?**

Docker is an open-source platform that automates the deployment, scaling, and management of applications in containers. It provides a standardized unit of software that includes code, runtime, libraries, and dependencies.

9.**What are Docker Components?**

Docker components include Docker Engine (the runtime environment), Docker Hub (a repository for storing and sharing Docker images), and Docker Compose (a tool for defining and running multi-container Docker applications).

10.**What is a Docker Container?**

A Docker container is a lightweight, standalone, and executable package that includes everything needed to run a piece of software, such as code, runtime, libraries, and dependencies.

**UNIT IV CLOUD DEPLOYMENT ENVIRONMENT**

PART-A

1. **What is Google App Engine?**

Google App Engine is a Platform as a Service (PaaS) provided by Google Cloud. It allows developers to build, deploy, and manage applications without worrying about the underlying infrastructure, providing automatic scaling and a range of services.

1. **What is Amazon AWS?**

Amazon Web Services (AWS) is a comprehensive and widely adopted cloud platform offered by Amazon. It provides a range of services, including computing power, storage, databases, and machine learning, on a pay-as-you-go basis.

1. **What is Microsoft Azure?**

Microsoft Azure is a cloud computing platform and service provided by Microsoft. It offers a wide range of cloud services, including computing, analytics, storage, and networking, enabling organizations to build, deploy, and manage applications efficiently.

1. **What are Cloud Software Environments?**

Cloud software environments are platforms and tools that provide the necessary infrastructure and services to develop, test, and deploy applications in the cloud. Examples include Google App Engine, Amazon AWS, and Microsoft Azure.

1. **What is Eucalyptus?**

Eucalyptus (Elastic Utility Computing Architecture for Linking Your Programs to Useful Systems) is an open-source software platform for building private and hybrid cloud environments. It provides Infrastructure as a Service (IaaS) capabilities and is compatible with Amazon AWS.

1. **What is OpenStack?**

OpenStack is an open-source cloud computing platform that provides a set of software tools for building and managing public and private clouds. It supports a range of services, including compute, storage, and networking, and is widely used in enterprise and research environments.

**7. What is Google Cloud Platform (GCP)?**

Google Cloud Platform (GCP) is a suite of cloud computing services provided by Google. It offers infrastructure, platform, and software services, enabling businesses to build, deploy, and scale applications, websites, and services.

**8.What is Amazon S3?**

Amazon Simple Storage Service (S3) is an object storage service offered by AWS. It provides scalable, secure, and durable storage for a wide range of data, including backups, application data, and media files.

**9.What is Azure Functions?**

Azure Functions is a serverless computing service provided by Microsoft Azure. It allows developers to run code on-demand without managing the underlying infrastructure, scaling automatically based on demand.

**10.What is Eucalyptus' relationship with AWS?**

Eucalyptus is compatible with Amazon Web Services (AWS) and can be used to create private and hybrid cloud environments that integrate seamlessly with AWS services, allowing for flexible cloud deployments.

**UNIT-V CLOUD SECURITY**

PART-A

1.**What is Guest Hopping in Virtualization System-Specific Attacks?**

Guest hopping is a virtualization system-specific attack where a malicious guest virtual machine (VM) gains unauthorized access to other guest VMs on the same host, potentially accessing their data and resources.

2.**What is a VM Migration Attack?**

A VM migration attack occurs when an attacker exploits vulnerabilities in the VM migration process, intercepting or tampering with the data being transferred between the source and destination hosts during the live migration of a VM.

3.**What is Hyperjacking?**

Hyperjacking is an attack where an attacker gains control of the hypervisor layer, which manages multiple VMs. By compromising the hypervisor, the attacker can gain control over all hosted VMs and manipulate their resources.

4.**What is Data Security and Storage in Cloud Computing?**

Data security and storage in cloud computing involve protecting data stored in the cloud from unauthorized access, corruption, and loss. This includes encryption, access controls, data backup, and compliance with security standards and regulations.

5. **What is Identity and Access Management (IAM)?**

Identity and Access Management (IAM) is a framework of policies and technologies for ensuring that the right individuals have the appropriate access to technology resources. It includes user authentication, authorization, and managing user identities.

6. **What are IAM Challenges?**

IAM challenges include managing the increasing number of user identities, ensuring secure access across multiple devices and locations, dealing with complex regulatory requirements, and integrating IAM solutions with existing systems.

7.**What is IAM Architecture and Practice?**

IAM architecture refers to the design and structure of an IAM system, including its components, such as identity repositories, authentication mechanisms, and access control policies. IAM practice involves implementing and managing these components to ensure secure and efficient access to resources.

8. **What is the role of encryption in data security?**

Encryption is a process that transforms readable data into an unreadable format using cryptographic algorithms. It ensures data confidentiality by preventing unauthorized access and protecting data from being intercepted or tampered with.

9. **What is Multi-Factor Authentication (MFA)?**

Multi-Factor Authentication (MFA) is a security mechanism that requires users to provide two or more authentication factors to verify their identity. These factors typically include something the user knows (password), something the user has (security token), and something the user is (biometric data).

10. **What is a Denial of Service (DoS) attack?**

A Denial of Service (DoS) attack is a cyber-attack where an attacker overwhelms a target system with excessive requests, causing it to become unavailable to legitimate users. This disrupts the normal functioning of the system and can lead to downtime.