RNS INSTITUTE OF TECHNOLOGY

Autonomous Institution Affiliated to VTU

Assignment 2: CLOUD COMPUTING

University Question Bank

A compilation of important questions for review

Question 1:

Explain Distributed system?

Answer: Distributed System

A distributed system is a type of computer system that consists of multiple independent computers or nodes that communicate with each other to achieve a common goal. Each node in the system is capable of performing a specific task, and they work together to provide a service or function that cannot be achieved by a single node. In a distributed system, nodes communicate with each other through a communication network, which allows them to share resources, exchange data, and coordinate their actions. This communication network can be wired or wireless, and it can be based on different communication protocols. Scheduling, resource allocation, and data consistency are some of the key challenges in designing and managing a distributed system. To overcome these challenges, distributed systems employ various techniques such as distributed databases, replication, and consensus protocols. <pdistributed and="" are="" areas,="" as="" availability,="" benefits,="" centers,="" cloud="" computing,="" costs.<="" data="" enterprise="" fault="" improved="" in="" including="" increased="" many="" networks.="" offer="" p="" reduced="

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Question 2:

Explain different Types of Hardware Virtualization Techniques.?

Answer: Hardware Virtualization Techniques

Hardware virtualization is a technology that allows multiple operating systems to share the same physical hardware resources. This is achieved by creating a layer of abstraction between the physical hardware and the operating system, allowing multiple virtual machines (VMs) to run on a single physical machine. There are two main types of hardware virtualization techniques: <ul> Type 1 (Bare-Metal) Hypervisors: These virtualization techniques run directly on the host machine's hardware, without the need for an underlying operating system. Examples of Type 1 hypervisors include VMware ESXi, KVM, and Xen. Type 2 (Host-Based) Hypervisors: These virtualization techniques run on top of an existing operating system, using the host OS as a layer of abstraction between the hypervisor and the hardware. Examples of Type 2 hypervisors include VMware Workstation, VirtualBox, and Parallels Desktop. Other types of hardware virtualization techniques: <ul> Para-Virtualization (P-V): This technique uses a combination of Type 1 and Type 2 hypervisor to create a layer of abstraction between the VM and the host hardware. Hardware-Assisted Virtualization (H-AV): This technique uses specific hardware features, such as Intel VT or AMD-V, to assist the hypervisor in creating and managing VMs.

Question 3:

Explain Service Oriented Computing 1?

Answer: Service Oriented Computing

Service-oriented computing (SOC) is a computing paradigm that emphasizes the provision of services to users over the internet or an internal network. In an SOA, services are designed to be autonomous, self-descriptive, and loosely coupled, allowing them to be easily composed and consumed by other services or applications. SOC is based on the idea that services should be designed to be reusable and flexible, allowing them to be composed and recombined in different ways to meet changing business needs. Services can be web services, EAI (Enterprise Application Integration) services, or B2B (Business-to-Business) services, among others. The key characteristics of SOA are: <ul> Services are autonomous: Services are designed to operate independently, without relying on other services. Services are self-descriptive: Services provide information about themselves, such as their functionality and interface. Services are loosely coupled: Services are designed to be loosely coupled, allowing them to be changed or replaced without affecting other services. Services are scalable: Services can be scaled up or down as needed, to meet changing business demands.

Question 4:

Explain how cloud computing provides solution for On-Demand and Dynamic Scaling?

Answer: Cloud Computing for On-Demand and Dynamic Scaling

Cloud computing is a model of delivering computing services over the internet, where resources such as servers, storage, databases, software, and applications are provided as a service to users. Cloud computing provides a solution for on-demand and dynamic scaling by allowing users to access and use computing resources as needed, without having to worry about the underlying infrastructure. On-demand scaling refers to the ability to scale up or down resources as needed, without having to forecast or predict usage. In a cloud environment, resources can be scaled up or down in real-time, without the need for manual intervention. This is achieved through the use of automation tools and APIs that can dynamically allocate and deallocate resources as needed. Dynamic scaling, on the other hand, refers to the ability to adjust resource allocation based on changing business needs. In a cloud environment, resources can be dynamically scaled based on metrics such as CPU usage, memory usage, or network traffic. This allows businesses to respond quickly to changing demand, and to optimize resource allocation for maximum efficiency. Cloud computing provides many benefits for on-demand and dynamic scaling, including: <ul> Increased flexibility: Cloud computing allows businesses to quickly adapt to changing business needs, without having to worry about the underlying infrastructure. Improved scalability: Cloud computing provides the ability to scale up or down resources as needed, without having to forecast or predict usage. Reduced costs: Cloud computing provides a pay-as-you-go pricing model, which can help reduce costs and improve cash flow.

Question 5:

Briefly discuss about cloud computing Platforms and Technologies?

Answer: Cloud Computing Platforms and Technologies

Cloud computing platforms and technologies are designed to provide a scalable and flexible infrastructure for deploying and managing cloud-based applications. Some of the key cloud computing platforms and technologies include: <ul> Infrastructure as a Service (IaaS): IaaS provides a virtualized infrastructure, allowing users to provision and manage virtual machines, storage, and networking resources. Platform as a Service (PaaS): PaaS provides a complete development and deployment environment, allowing users to build, deploy, and manage applications without having to worry about the underlying infrastructure. Software as a Service (SaaS): SaaS provides software applications over the internet, allowing users to access and use applications without having to install or maintain them. Cloud Management Platforms: Cloud management platforms provide tools and APIs for managing and monitoring cloud-based applications and infrastructure. Some of the key cloud computing technologies include: <ul> Virtualization: Virtualization technology allows multiple virtual machines to run on a single physical machine, improving resource utilization and scalability. Containers: Containers provide a lightweight and portable way to package and deploy applications, allowing for greater flexibility and scalability. Microservices: Microservices provide a service-oriented architecture that allows applications to be broken down into smaller, independent services, improving scalability and flexibility.

Question 6:

Explain Machine Reference Model of Virtualizing an Execution Environment?

Answer: Machine Reference Model of Virtualizing an Execution Environment

The Machine Reference Model (MRM) is a conceptual model that provides a framework for understanding how virtual machines (VMs) work. The MRM is based on the idea that a VM is a self-contained environment that provides a layer of abstraction between the guest operating system and the physical hardware. The MRM defines five layers of abstraction: <ul> "Physical" layer: The physical layer represents the underlying physical hardware, such as the CPU, memory, and storage. "Machine" layer: The machine layer represents the virtual machine monitor (VMM), which provides a layer of abstraction between the VM and the physical hardware. "Virtual" layer: The virtual layer represents the virtual machine itself, which is a self-contained environment that provides a layer of abstraction between the guest operating system and the physical hardware. "Protected" layer: The protected layer represents the protected mode, which provides a layer of protection between the VM and the physical hardware. "Portable" layer: The portable layer represents the portable code, which is the code that can be run on a variety of different hardware architectures. The MRM provides a framework for understanding how virtualization works, and how virtual machines can be used to improve resource utilization and scalability.

Question 7:

Explain different types of Cloud Deployment Models.?

Answer: Cloud Deployment Models

Cloud deployment models are the different ways that cloud infrastructure can be set up

and used. There are several different types of cloud deployment models, including: <ul> Public Cloud: A public cloud is a cloud deployment model where the infrastructure is owned and operated by a third-party provider, and is accessed over the internet. Private Cloud: A private cloud is a cloud deployment model where the infrastructure is owned and operated by a single organization, and is not accessed over the internet. Hybrid Cloud: A hybrid cloud is a cloud deployment model where multiple cloud environments are combined, such as a public cloud and a private cloud. Community Cloud: A community cloud is a cloud deployment model where a group of organizations share a cloud infrastructure, such as a university or government agency. Edge Cloud: An edge cloud is a cloud deployment model where computing resources are deployed at the edge of the network, such as a remote office or a smart device. The choice of cloud deployment model will depend on the needs of the organization, including security, scalability, and cost considerations.