NETAJI SUBHASH ENGINEERING COLLEGE

Name: - Subhajit Das

Stream: - AIML

Class Roll: - 10

University Roll: - 10930621010

Semester: - 5th

Subject : cloud computing

2) What is a workload in IaaS? Explain in details how workloads are handled in an Iaas infrastructure.

→ A workload in Iaas refers to the collection of computing resources and software applications that are required to perform a special task or process within a virtualized or cloud-based environment. It can vary widely in terms of their complexity and resource requirements.

How workloads are handled in Iaas infrastructure:

(i) Resource provisioning → In an Iaas environment, the cloud service provider offers a pool of virtualized computing resources such as VMs, storage & network.

(ii) Virtualization → Virtualization is a key technology in Iaas that allows for the creation of virtual instance of physical resources.

(iii) Scalability → Iaas platforms provide scalability options, allowing user to scale their workloads up or down based on demand.

(iv) Resource Management → Iaas platforms include resource management tools that help allocate and optimize computing resources for workloads.

(v) Networking → Iaas environment offers networking capabilities, include virtual networks and load balancers, to ensure that workloads are accessible and highly available.

(vi) Storage → Iaas providers offer various types of storage options, such as block storage, object storage and file storage.

1) What are pods, aggregation, and silos in cloud computing? In what situations can we consider creating a silo? Explain in detail.

→ Pods → It is often used to describe a group of tightly coupled containers or VMs that work together to serve a specific application. These containers or VMs are typically deployed together and share common resources, such as networking and storage.

Aggregation → It typically refers to the grouping of resources, data or services. It involves bringing together related components or data points into a unified view or structure for better management, analysis or processing.

Silos → It refers to an isolated and separate environment or organizational structure that operates independently of other parts of the organization. Silos can exist at various levels, including data silos, application silos, or organization silos.

When to consider creating a silo in cloud computing:

(i) Security & compliance requirements: In cases where certain data or application must adhere to strict security and compliance standards.

(ii) Resource isolation → some workloads may have unique requirements that are best served by isolation.

(iii) Testing and development → During software development, creating isolated development, testing and staging environments can help prevent conflicts.

(iv) Legacy systems → Transitioning from legacy systems to cloud-native solutions may involve isolating legacy applications to maintain capatibility.

5) What is Load Balancing and Virtualization in cloud computing? Give a clear view of a simple load-balancing system.

→ Load Balancing is a crucial component of cloud computing that distributes incoming network traffic or workloads across multiple servers or resources to ensure optimal utilization and maximize performance, availability and reliability.

Virtualization is a foundational technology in cloud computing that allows multiple virtual instances to run on a single physical server. Virtualization abstracts the physical hardware, making it more flexible and efficient.

A simple load-balancing system:

To implement a simple-load balancing system, we can introduce a load balancer between the users and the webserver. Here's how it works -

(i) Incoming Request → User access the web application by sending request to public IP address associated with the load balancer.

(ii) Load Balancer → The load Balancer receive these requests and decides which web server should handle requests.

(iii) Distribution → The load Balancer distributes incoming requests evenly among multiple web servers, ensuring that no single server is overwhelmed with traffic.

(iv) Server Health Monitoring → The load Balancer continuously monitors the health of the web servers.

(v) Scaling → As the traffic volume fluctuates, additional web services can be added to the pool and the load Balancer dynamically adjusts its distribution to accomodate the changes.

4) What is compliance-as-a-service (CaaS)? Describe an existing example of a CaaS system.

→ CaaS is a cloud-based service model that assists organization in achieving and maintaining compliance with various industry regulations, standards and data protection laws.

Example of a CaaS system:

OneTrust:

- OneTrust is an existing example of a CaaS system. It provides a comprehensive platforms for privacy, security particularly in the context of data protection regulations like the General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA).
- OneTrust offers a suit of compliance tools, including consent management, data mapping and privacy impact assessment.
- companies use OneTrust to streamline compliance efforts, manage data protection policies and respond to regulatory changes. The platform helps organizations avoid non-compliance penalties, build trust with customer and demonstrate a commitment to data privacy and security.

3) What are the main characters of Saas? Give 3 brief case studies of Saas platforms that operate currently.

→ The main characteristics of Saas are:

(a) Accessibility
(b) Subscription-Based Pricing
(c) Managed by the Provider
(d) Multi-Tenancy
(e) Automatic Updates
(f) Scalability
(g) Collaboration & Integration

Three case studies:

(i) Salesforce: A global company with a distributed sales team uses Salesforce to centralize customer data, streamline sales processes, resulting in improved customer relationships and increased revenue.

(ii) Microsoft 365: A medium size company adopt Microsoft 365 to enable remote work and collaboration. Employees uses teams for virtual meetings, sharepoint for doc sharing.

(iii) Zendesk: An e-comerce company uses Zendesk to centralize customer support requests from email, chat and social media. Zendesk's automation and reporting features help the company provide timely and personalize support to customers, resulting in improved customer satisfaction.