Cloud computing CSIZG527/SEZG527/SSZG527)(S1-22)
Assignment 1

Chinmay Chandrashekhar Hegde

2021mt12049@wilp.bits-pilani.ac.in

Q1. Which are the different layers that define cloud architecture?

Answer 1:

Cloud computing works on the virtualization and dynamic allocation of resources. Architecturally, Cloud can be divided into 4 layers:

1. Physical layer: Contains physical servers, network etc.

2. Infrastructure layer: Virtualized servers, networking, and storage resources. Infrastructure as a Service is the hosted delivery of infrastructure services such as servers, networks, and other hardware to consumers. IaaS provides consumers access to on-demand, scalable storage, and compute power.

3. Platform layer: which contains components or services like Windows Azure, Google App Engine. A platform for development, deployment. Platform as a Service offers a complete platform and the tools to develop and deploy applications on the platform.

4. Application Layer: This is the layer end users interact with. This contains software which are delivered as service like Gmail, Salesforce, Dropbox etc. Software as a Service is the hosted delivery of Software that consumers can access over the internet. Two features of a SaaS application are scalability and configurability. SaaS applications should be able to quickly scale with demand. In mature SaaS applications, the customer should be able to customize their instance of the software using meta-data.

Chinmay Chandrashekhar Hegde 2021mt12049@wilp.bits-pilani.ac.in

Q2.What are the security aspects provided with the cloud?

To make cloud services secure, security applications are deployed in two or more layers:

• The first layer comprises of the firewall. Note that firewall can be both hardware and application based. The function of this security system is to avoid entry and exit of phony data packets in and out of the system.

• Request-based access also stands at the network entry. It filters out most unwanted intruders by denying access straightaway.

• Antivirus and anti-spyware comprise predominantly the second layer. It eliminates threats that have somehow crept into the system.

• Some firewalls also stand guard at the network exit points. This is perhaps the last line of defence. Any threat that may have successfully evaded the system and the antivirus should be identified and blocked here. Exit firewall buttresses the security of the cloud.

Key technologies that make it more secured are –

- Encryption
- Firewall
- Security Policies
- Backup Plans

Chinmay Chandrashekhar Hegde 2021mt12049@wilp.bits-pilani.ac.in

Q3. What is the requirement of virtualization platform in implementing cloud?

Virtualization is the basis of the cloud computing and there are many platforms that are available like VMware is a technology that provides the provision to create private cloud and provide a bridge to connect external cloud with private cloud. There are three key features that have to be identified to make a private cloud that is:

- Cloud operating system.
- Manage the Service level policies
- Virtualization keeps the user level and the backend level concepts different from each other so that a seamless environment can be created between both.

Chinmay Chandrashekhar Hegde 2021mt12049@wilp.bits-pilani.ac.in

Q4. Explain what are the different modes of software as a service (SaaS)?

Answer 4:

Software as a Service (SaaS) is used to offer different kinds of software applications in a Cloud environment. Generally, these are offered on subscription basis.

Different modes of SaaS are:

1. Simple multi-tenancy: In this setup, each client gets its own resources. These resources are not shared with other clients. It is more secure option since there is no sharing of resources. But it an inefficient option, since for each client more money is needed to scale it with the rising demands. Also, it takes time to scale up the application in this mode.
2. Fine grain multi-tenancy: In this mode, the feature provided to each client is same. The resources are shared among multiple clients. It is an efficient mode of cloud service, in which data is kept private among different clients but computing resources are shared. Also, it is easier and quicker to scale up the SaaS implementation for different clients.

Q5.Before going for cloud computing platform what are the essential things to be taken in concern by users?

Answer 5:

Following are the essential things that must be followed before going for the cloud computing platform:

• Adaptability: Heterogeneous usage contexts demand a certain amount of adaptability from a cloud solution. The way of accessing a solution, the platform that is used, and the way users are dealing with the system are diverse and are constantly changing.

• Security: Of course, security is always an aspect to consider when talking about cloud computing. Service providers promise that they can be more secure than physical data centres.

• Integration: Typical applications rely on data from other applications. The worst case would be to have separate data pools with unsynchronized content, which can lead to redundancy and inconsistency across applications. Data from other applications can enrich cloud services and provide comprehensive insight.

• Migration: The aspect of integration leads us to the next point: migration. What do you do if your cloud provider goes out of business? Are you able to migrate your valuable business data to another platform or have you locked-in a particular vendor? These questions should be asked before the decision for a particular provider is made.

• Other aspects include – Compliance, Data Storage, Business Continuity, Data Integrity

Q6. State the list of a need of virtualization platform in implementing cloud?

Answer 6:

• Virtualization is the foundation of cloud computing. It enables creation of an intelligent layer of abstraction to hide the intricacies of the software or hardware that is underlying beneath the layer.

• Virtualization separates the back-end level and user level for creation of a seamless environment between the two.

• Virtualization is used for deployment of models of cloud hosting services including Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) among others.

Following are the three Important Attributes of Virtualization that Signify its Role in Cloud Computing:

- Partitioning can be used for supporting a multitude of operating systems and applications within a single physical system such as a web server.
- Isolation imparts protection to virtual machines from any events such as virus attacks or crashes in other machines. Additionally, encapsulation is also used for protection of every application to prevent it from interfering with other applications.
- Virtual machines can use encapsulation for being represented as well as stored as single files in order to facilitate their identification and presentation to other applications

Virtualization can be used for almost any component including applications, operating systems, hardware, networks, memory, and storage to name a few. Virtualization is important for cloud computing because of its ability of decoupling hardware from software.

Chinmay Chandrashekhar Hegde 2021mt12049@wilp.bits-pilani.ac.in