

Jamia Millia Islamia



Dept. Of Computer Science
Big Data Assignment-1

Submitted By: Wasit Shafi

Submitted To: Dr.Mansaf Alam

Roll no: 18MCA054

Q1. What are essential characteristics of cloud computing?

Sol: The Following are the five essential characteristics of cloud computing:-

On-demand self-service.

A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider.

Broad network access.

Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations).

Resource pooling.

The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or data center). Examples of resources include storage, processing, memory, and network bandwidth.

Rapid elasticity.

Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.

Measured service.

Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service

Q2. What is virtualization? Discuss Advantages of virtual Machine.

Sol :

Virtualization : Virtualization is the creation of a virtual form of a computing resource like a computer, server, or other hardware component, or a software-based resource such as an operating system. The most common example of virtualization is partitioning a hard disk during OS installation, where the physical hard drive is split into multiple logical disks to provide better data storage and retrieval (a category known as 'data virtualization').

Advantages of virtualization:

- Gain better performance and efficiency from resources in the existing computing components, using CPU virtualization.
- Boost virtual machine (VM) security. Since VMs are logically separated from each other, a malware attack or other software glitch on one VM won't affect other VMs.
- Save money on hardware. Virtualization software involve less cost, and also require lesser hardware to run than physical machines.
- Gain peace of mind. VMs provide better reliability in terms of disaster recovery as well as better backup and retrieval capabilities.

Q3. What are software licenses? Discuss simple cost model.

Sol:

Software license

A software license is a legal instrument governing the use or redistribution of software. Under United States copyright law, all software is copyright protected, in both source code and object code forms, unless that software was developed by the United States Government, in which case it cannot be copyrighted.

Simple cost model

A Cost Model is a mathematical model that needs parametric equations for estimating the costs of a product. It is typically necessary to get approval to proceed for a business plan or budget or financial planning. Initially, these equations were performed manually but it has become computerized for a long time now. The algorithm processes, depending on the product or

project, are sometimes standardized or sometimes proprietary. Also standard spreadsheets are often used for simple models.

**Q4. What do you mean by service levels for cloud applications?
Explain Reserved , spot and on-demand instances**

Sol:

Service Levels for Cloud Applications

When a company offers a service—whether in the cloud or in a traditional data center - that company generally provides its customers with a *service level agreement* (SLA) that identifies key metrics (*service levels*) that the customer can reasonably expect from the service. The ability to understand and to fully trust the *availability, reliability, and performance* of the cloud is the key conceptual block for many technologists interested in moving into the cloud.

Reserved Pricing

With reserved instances, you get the same instance hardware, but you pay less. You make some form of commitment at the beginning, and then you get to pay for the instance at a discounted rate. I'll use made-up round numbers as an example to explain the concept:

- On-demand rate - \$100/mo.
- Up-front payment - \$500/mo
- Discount reserved rate - \$10/mo.

The total cost for on-demand after 1 year would be \$1,200. The total cost for reserved after a year would be \$500 + \$120 = \$620. After a year, You save \$580. In this case, your discount would be 48% 🎯

Within reserved pricing, there are so many details it can make even an experienced accountant run for the hills 😬

- There are 1-year or 3-year terms. Of course, you save even more money the longer you commit.

Spot Pricing

Now for the most exciting pricing option: spot. With spot instances, the commitment concept gets reversed. Instead the of lack of a commitment benefiting you, it applies the other way to AWS. With on-demand, you do not commit to AWS. With spot, AWS does not commit to you. With this kicker

model, the pricing becomes extremely attractive. We're talking about a 50% to 90% savings. That's not just me being overly optimistic. I've seen these savings realized repeatedly.

The way spot works is that you bid for your instance, like an eBay auction. If the spot market price is below your bid price then get the instance at the market price. I'll repeat that. You pay the lower market price, not the price you bid on. An example to help explain:

- On-Demand price: \$1/hr
- The market spot price: \$0.2/hr
- Your bid price: \$0.5/hr
- What you pay: \$0.2/hr

This is a fascinating model and is favourable to saving you even more money. I think it's a genius move by AWS. Imagine if eBay ran this way. You win an item on eBay and you pay the second highest bid that lost. Awesome for you right?

With spot instances, the biggest disadvantage is that AWS can terminate your instance at any time. Remember there's no commitment from AWS to give you the instance. This is not so awesome, right? Because of this and the generous pricing model, people

On-Demand Pricing

With on-demand, you pretty much can get a server at any time and there's no commitment from you. At times of extremely high demand, you might not be able to get a server. It rarely happens though. For example, it can happen during AZ outage when customers might start flood requests to an AZ because their current AZ is down. Even in these rare times when an AZ is down, I've been able to get instances though. That's how rare it is not to get an on-demand instance. Once you get the on-demand instance you keep it until you terminate it. In this pricing model, you pay the most because you can leave at any time.