Cloud Virtualization

UNIT III CAP 470

Introduction

- Virtualization is the "creation of a virtual (rather than actual) version of something, such as a server, a desktop, a storage device, an operating system or network resources".
- In other words, Virtualization is a technique, which allows to share a single physical instance of a resource or an application among multiple customers and organizations.
- It does by assigning a logical name to a physical storage and providing a pointer to that physical resource when demanded.

What is the concept behind the Virtualization?

- Creation of a virtual machine over existing operating system and hardware is known as Hardware Virtualization. A Virtual machine provides an environment that is logically separated from the underlying hardware.
- The machine on which the virtual machine is going to create is known as Host Machine and that virtual machine is referred as a Guest Machine

Types of Virtualization:

- Hardware Virtualization.
- Operating system Virtualization.
- Server Virtualization.
- Storage Virtualization.

Hardware Virtualization:

When the virtual machine software or virtual machine manager (VMM) is directly installed on the hardware system is known as hardware virtualization. The main job of hypervisor is to control and monitoring the processor, memory and other hardware resources.

Usage:

Hardware virtualization is mainly done for the server platforms, because controlling virtual machines is much easier than controlling a physical server.

Operating System Virtualization:

When the virtual machine software or virtual machine manager (VMM) is installed on the Host operating system instead of directly on the hardware system is known as operating system virtualization.

Usage:

Operating System Virtualization is mainly used for testing the applications on different platforms of OS.

Server Virtualization:

When the virtual machine software or virtual machine manager (VMM) is directly installed on the Server system is known as server virtualization.

Usage:

Server virtualization is done because a single physical server can be divided into multiple servers on the demand basis and for balancing the load.

Storage Virtualization:

Storage virtualization is the process of grouping the physical storage from multiple network storage devices so that it looks like a single storage device.

Storage virtualization is also implemented by using software applications.

Usage:

Storage virtualization is mainly done for back-up and recovery purposes.

Advantages of Virtualization

Cost

Using a virtualization system is actually cheaper due to the fact that it doesn't require any hardware components. Therefore, IT infrastructures consider it inexpensive because there is no investment involved in to create on-site resources or any separate areas of space. The only thing that you need is the license or the access from the third party who maintains all the servers.

Efficiency

Virtualization also allows automatic updates to the hardwares and softwares by installing on their third party provider. Due to this IT professionals do not need to spend money for individuals and corporations.

Uptime

Virtualization has the capability to prevent unnecessary downtime by making use of resources the maximum. Even budget friendly virtualization services can offer an uptime of almost 99.9% today. This can be especially beneficial for small businesses which uses data for testing.

Deployment

Deploying resources are considerably faster when using the virtualization technology. Time spent on creating local networks or setting up physical machines can be saved significantly. Thus, the only thing that you need is at least a single access to the virtual environment.

Energy Savings

Using virtualization literally means that the system is more energy efficient since there is no hardware or software that is being used. This helps the companies to neglect the cooling cost of the data center which can significantly reduce the cost of utility bills. Moreover it is more environment friendly because it reduces carbon footprint.

Disadvantages of Virtualization

Implementation

Although it is mentioned that the virtualization is highly cost effective still it needs more investment when it comes to implementation. This is because at some instance the hardwares and softwares are required which means that devices needs to be purchased to make the virtualization possible.

Limitations

Virtualization does involves many limitations. Every server and application out there is not virtualization compatible. Hence, some of the IT infrastructure of the organizations will not be supporting the virtualized solutions.

Security

Data is a crucial aspect of every organization. Data security is often questioned in a virtualized environment since the server is managed by managed by the third party providers. Therefore, it is important to choose the virtualization solution wisely so that it can provide adequate protection.

Availability

Availability is another important aspect of an organization. The data needs to be connected for a prolonged period of time. If not the organization will be going to loose the competition in the industry

Video link

- https://www.youtube.com/watch?v=s8cPheRCltc
- https://www.youtube.com/watch?v=_pPlanX5wQY