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Virtualization: A New Trend in the Sector of Computing Technology

Divyank Jain

B.E. Student, Dept. of C.S., Swami Vivekananda College of Engineering, Indore, India

ABSTRACT: Cloud computing is one of the most prominent term in IT sector .It is also the most acquiring technology in corporate world. The whole working of cloud computing is based on the concept of virtualization. Virtualization concept maintains the popularity of cloud computing The primary focus of this paper is to describe the basic concept of cloud computing moreover this paper also describe the concept of virtualization and define the difference between virtualization and traditional physical system.

KEYWORDS: Cloud Computing, Virtualization, Virtual System, Physical System.

I. INTRODUCTION

Cloud computing is a well known concept in IT sector. It is the most emerging technology of Twenty-first century. Since past seven years this technology has immensely contributed in changing the trends in IT sector. Working of Cloud computing can be described as providing services on internet or in simple words giving online services on rent.

II. CLOUD COMPUTING SERVICES

Cloud computing provides different services in different sectors. These services are as follows:

Software-as-a-service: In software as a service the user is provided with the usage of running the applications on cloud.

Platform-as-a-service: In platform as a service a user can make his/her applications on cloud using libraries, programming languages, etc.

Infrastructure-as-a-service: In infrastructure as a service the user is provided with virtual server instances where the user can maneuver their virtual servers and storage. ^[2]

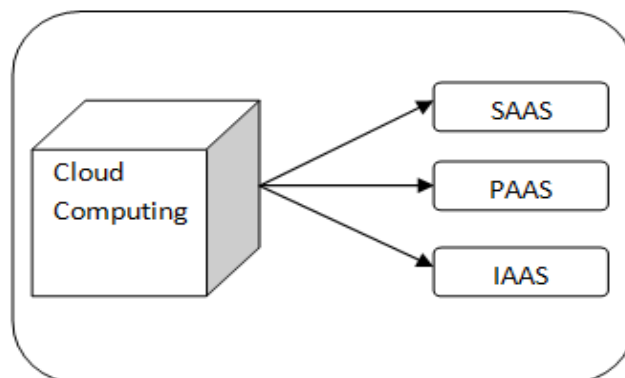


Fig. 1. Types of cloud services



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When we discuss about cloud, there's no way we are going to miss Virtualization. Nowadays, wherever we use cloud, virtualization is also present. Virtualization is the backbone of cloud computing system. Virtualization helps to run various operating systems on a single machine, Moreover various applications can also run simultaneously in virtualization. When we talk about virtualization the concept of hypervisor comes into picture. It is also known as VMM i.e. virtual machine monitor. The most interesting thing about virtualization is that it is used in developing servers, different workstations, storage and other things independent from the physical hardware layer

III. VIRTUAL SYSTEMS

Before talking about virtual systems let us first understand what exactly virtualization is. Virtualization means that something which is present virtually but not physically. Users feel that the things which we are dealing with are present in reality but actually it's not. Virtual system are those which are totally different from physical system, in physical system users have limitation of storage, using multiple operating systems and many more such things, whereas in virtual system the limitations has been ameliorated and with the help of virtual system various parameters of physical system which were facing problems got resolved.

IV. PROLIFIC NATURE OF VIRTUAL SYSTEM

As the concept of virtualization is basically related to less physical system, hence by not taking many physical systems into use, it turns out to be economic, that means virtualization is cost effective. It is cost effective because we don't need to have the space for larger physical systems, most importantly less maintenance, for them, we don't have to buy them at a higher rate. Other advantage is of resource pooling, a service provider can provide his resources if they are not in use to the user who wants to use, with this the resources which are temporarily not in action gets a job. By elucidating the concept of service provider and user, one more advantage is that users can have all the utilities or resources at their door step.

V. ADVANTAGES OF VIRTUAL SYSTEM OVER PHYSICAL SYSTEM

Some factors are analyzed which proves that virtual systems are better as compared with traditional system. These factors are as follows:

- **Cost:** Cost is one of the predominant factors when we compare virtual and traditional system. Firstly in physical system usage of hardware is more as compared to virtual system. In virtual system hardware resources are less used .As hardware resources are directly related with cost that's why virtual system are economical as compared to traditional physical system. Second reason why virtualization is economical is as it require less hardware usage. Users do not need to spend too much money on maintenance of hardware. Hence virtualization is economical as compared to traditional system.
- **Exploiting hardware:** When it comes to hardware utilization physical systems are not that much fruitful, most of the time the hardware is left idle in physical system, whereas in virtual system exploitation of hardware is up to 80% more utilization of server as compared to physical server, hence we can say physical systems are malnourished in terms of using hardware utilization, whereas virtualization and the systems makes most of the hardware outlay.
- **Diversified:** Now, diversified nature of virtual systems basically, focuses on various instances what virtual systems can offer and physical systems cannot. Firstly, talking about various operating systems, in physical systems we can have various operating systems, but for that we have to install the various operating system manually, and at a time we cannot switch to a different operating system instantaneously, other than that it isn't necessary that the various operating system which are being installed will be having the need of same physical configuration, other than that, physical systems stores a lot of hardware space, whereas in virtual systems we can just have a software and through that we can use various



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operating systems just by using their image files, and we can use the operating systems according to our physical configuration, switching is very handy, and memory utilization is very less compared to physical systems.

Secondly, in physical system the deployment of server process is not as easy as compared to virtual systems. We can change the configuration of servers during the execution of services and can frequently add or remove servers in virtual environment.

- **Networking:** Virtualization helps in network management, by effectively maintaining and optimizing the network speed, security and all the complexities of network. Network virtualization is intended to improve productivity, efficiency and job satisfaction of the administrator by performing many of these tasks automatically, thereby disguising the true complexity of the network.^[6]

<i>S.No.</i>	<i>Parameters</i>	<i>Physical system</i>	<i>Virtual system</i>
1.	Cost	More use of physical hardware	Less use of physical hardware
2.	Exploiting hardware	Hardware utilization less	Hardware utilization 80% more
3.	Diversified	Various operating systems can be installed manually which takes lot of space as well as switching time is more.	Various operating systems can be made use of with very less memory use and switching time is less.
4.	Network virtualization	Less secure and is less efficient.	Effectively maintaining and optimizing the network speed, security and all the complexities of network
5.	Backups	Less management require	High amount of management is required
6.	Maintenance	No special skills to maintain servers.	Special skills are needed to maintain virtual servers

Table 1: Comparison of virtual system over physical systems

VI. DISADVANTAGES OF VIRTUAL SYSTEM OVER PHYSICAL SYSTEMS

With many advantages some factors observed which low down the popularity of virtualization. These factors are as follows:



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- **Slow Down the Performance of System:** The biggest disadvantage of virtual system is that without any physical system we cannot create a virtual system, but vice versa is possible. Term resource hogging comes into picture when we talk about cons of virtual system, in which we experience during the slowing of system and frequent system crashes.
- **Variation in providing services:** When we talk about using application on virtual system, they differ what we experience at the time of using them in a physical system, the resource requirement get multiplied when we use applications on virtual system, but on physical systems application are self-effacing.
- **Backup:** Other disadvantage is about backups, when we delve into backing up the virtual systems, there are software presents for single purpose operating system, but when it comes to virtual systems you need to have a greater management for each virtual system present. Database management system products almost universally make replication and recovery straightforward, which mutes that aspect of attraction to virtualization.^[11]

Furthermore, when we are making less number of virtual systems and using it, till that time it is fine, but when the number gets increasing the need of monitoring them and maintaining them also increases, and maintaining physical system and virtual system is all together a different story, the skills and the managing and maintaining techniques differs which turns out to be a little problem.

VII. CONCLUSION

The paper explored about various services of cloud computing. Moreover this paper describe the importance of virtualization in cloud computing. Furthermore, this paper discussed about advantages and disadvantages of virtual system over physical system.

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BIOGRAPHY

Divyank Jain is a student, pursuing B.E. in Computer Science branch from Swami Vivekanand College of Engineering, RGPV University. His research interests are Cloud Computing, Operating System, etc.