International Journal of Scientific Research in Computer Science, Engineering and Information Technology
ISSN : 2456-3307 (www.ijsrcseit.com)
doi : https://doi.org/10.32628/CSEIT20641

Virtualization In Cloud Computing

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Article Info
Volume 6, Issue 4
Page Number: 01-05
Publication Issue :
July-August-2020

Article History
Accepted : 01 July 2020
Published : 07 July 2020

ABSTRACT

Cloud computing is one of the well developing fields in Computer Technology. Now days cloud computing is one of the fast growing technology because of online, cheap and pay as use scheme. Cloud Computing involves the concepts of parallel processing and distributed computing in order to provide the shared resources by means of Virtual Machines(VMs) hosted by physical servers. It is a service oriented design that reduces the cost of access to gather the information of the clients offer greater flexibility and demand based services. Cloud computing is emerging fastly and no doubt it is the next generation technology where humans will be using anywhere and anytime. In this internet world cloud computing is raising high by providing everything incense the required resources, applications, software, hardware, computing power to computing infrastructure, business process to control collaboration. Apart of its popularity it has some concerns which are becoming huddles for its wider adoption. In this paper a study has been made on virtualization concerns. In this paper, we present a complete survey of cloud computing and virtual machine migration.

Keywords : Distributed Computing, On Demand Resources, Cloud Computing, Virtualization.

I. INTRODUCTION

In the cloud computing, the computing resources are provided to the client through virtualization, on the internet. The large scale computing infrastructure is established by cloud providers to make availability of online computing services in flexible manner so the user find easiness to use the computing services[1]. The IT world is looking forward for the services provided by cloud computing thus boosting up the development of cloud computing. According to NIST cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources. The computing resources include networks, servers, storage, applications, and services. According to 2013 future of cloud computing survey reveals that cloud adoption continued to rise in 2013, with.

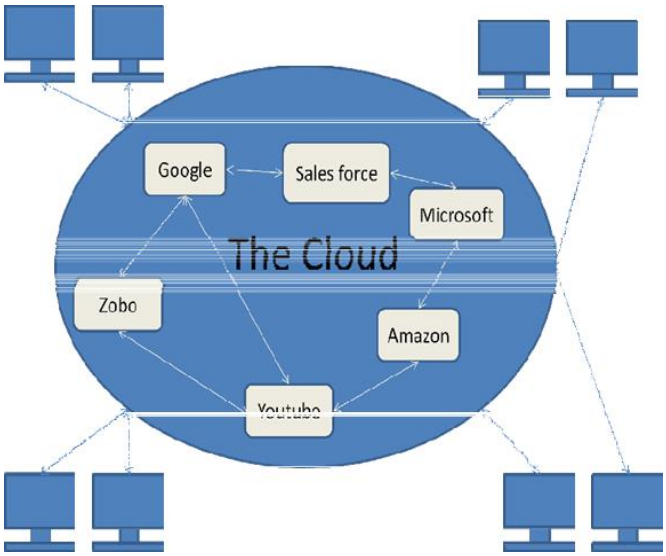

Fig 1: Cloud Computing

75 percent of those surveyed reporting the use of some sort of cloud platform up from 67 percent last year. That growth is consistent with forecasts from GigaOM Research, which expects the total worldwide addressable market for cloud computing to reach $158.8B by 2014, an increase of 126.5 percent from 2011. As many enterprises, government organization, and other companies begin to start to use cloud computing, security issues came out as a basic problem in computing, as every individual client or user preferred to work on a clear and safe environment where privacy and security of their data is a major concern [2]. In this paper, we discuss the overview of cloud computing with their components basic model and process scheduling. The goal of the paper is provide a complete study of cloud computing with different types.

DEFINITION OF CLOUD COMPUTING:

Cloud computing is the outcome of grid computing, utility computing and automatic computing. Cloud is a parallel and distributed computing system which consists a set of inter-connected and virtualized computers which gives one or more unified computing resources based on the requirements between service providers and service consumers [4]. Cloud computing is on demand pay-as-use i.e billing is done based on the usage of the customer which downs the operational and capital cost. Users can access applications which are present outside the working site which can access remote applications through internet connection devices. By this, computer resources can be efficiently used and consume less computing power and resources are shared cooperatively.

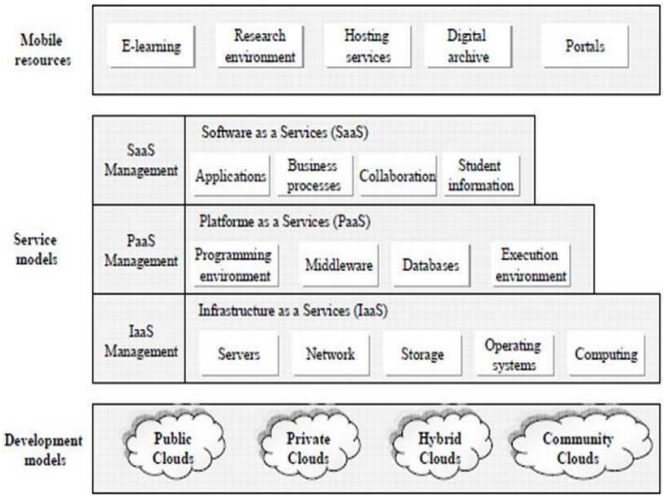

Fig 1.1: Architecture of Cloud

Cloud computing services are first offered by Amazon, Google, Microsoft and now many exist in the market. These services are used by software industries, government sectors, and health care sectors and in many more fields. The main power of cloud computing lies in the way data is stored, how it is transmitted and accessed. A virtualized platform with management capabilities like availability, automated load balancing and fault tolerance reduces infrastructure cost and maintenance cost.

COMPONENTS OF CLOUD COMPUTING:

Cloud computing has clients, data centers, distributed servers as the components.

- Clients: Users like computers, laptops, tablets computers mobile phones or PDA's.

- Data Centers: These are a collection of servers where the application is hosted. Virtualization is done where multiple instances of virtual servers are created.
- Distributed Server: Servers which reside non-locally which are geographically far.

Software as a Service is the model in which an application is hosted as a service to customers who access through internet. Users can access their application anywhere if they are connected to internet.

Some of the applications are CRM (customer Resource Managing), accounting and web content managing.

The main advantage of SaaS is that

- Users can get software with less money than buying and installing it.
- It offers web reliability, as the web is reliable the applications that are running are more reliable.
- Security is ensured as it uses SSL (secure socket layer).

CLOUD WORKING PRINCIPLE:

Resource virtualization is the foundation for cloud computing. Virtualization provides isolated, transparent, encapsulated, and manageable environment for both cloud service providers and end users. By following an elastic resource pool, virtualization allows cloud service providers and users to make use of the computing/storage resources more capably, such as load balancing, energy saving, host failure handling, and users' resource reassignment. In these basic functional modules, we often need to live migrate a virtual machine (VM) from one host to another without interrupting the current running applications in the VM. In order to provide services, large-scale data centers are established. These data center contain numbers of running computational nodes given that virtualization by introducing many virtual machines (VMs) on each node. Fig: 1, shows the actual system view cloud computing environment. There are mainly two types of actors on cloud: end-user and brokers. The end-user requests for the application on cloud and brokers process these request.

CLOUD DEPLOYMENT MODELS:

In the cloud computing deployment model services like software and hardware infrastructure, networking, storage are provided to the clients. Cloud has three working models.

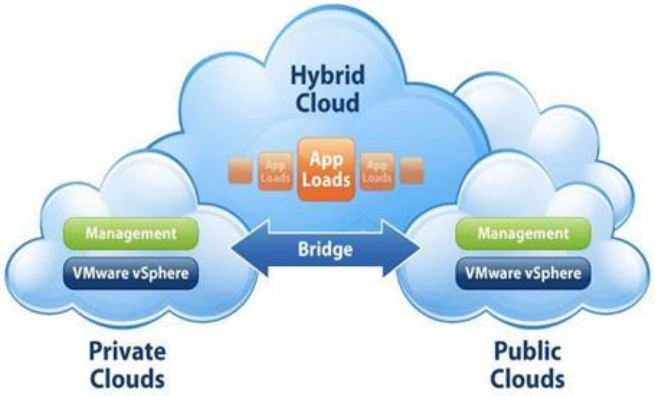

Fig 1.2: Types of Cloud

There are different clouds is as follows

- **Private Cloud**

Private Cloud is a model of cloud computing whose frame is permitted to use with a particular organization. All the resources and services are keen to a limited number of peoples. The server and data center is also setup within organization. Occasionally infrastructure is setup by third party but it is in full control of organization. The private clouds are good to privacy and security.

- **Public Cloud**

Public cloud is model of cloud where all users are allowed to access the services using internet. The

user need only internet connection and web browser to access with pay per use scheme.

- **Hybrid Cloud**

Hybrid cloud combines both public and private cloud with their advantages. Hybrid cloud offers the benefits of both the public and private cloud. The hybrid cloud is the good explanation for purely business oriented thought because many contemporary businesses have a wide range of concerns to support user's requirement.

VIRTUALIZATION IN CLOUD COMPUTING:

Virtualization in computing is creation of virtual (not real) of virtual something such as hardware, software, platform or a operating system or a storage or a network device [8]. In a virtualized environment IT enterprise has to manage many changes as the changes occur more quickly in virtual environment than in a physical environment. Because of virtualization clouds are scalable and agile.

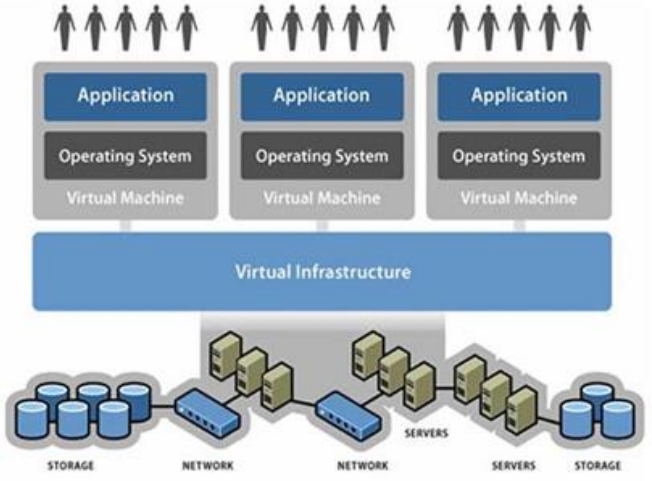

Fig1.3: Virtualization Mechanism

ADVANTAGES OF VIRTUALIZATION IN CLOUD COMPUTING:

Virtualization technology makes cloud computing environment easily to manage the resources. It abstracts and isolates the underlying hardware, and networking resources in a single hosting environment. It increases the security of cloud computing by protecting both the integrity on guest virtual machine and cloud components virtualized machines can be scaled up or down on demand and can provide reliability. It provides resource sharing, high utilization of pooled resources, rapid provisioning and workload isolation.

The recent trends in virtualization are consolidation of data centers thus reducing the managing cost. Apart of its benefits it has some drawbacks like managing virtual resources is critical and migrating services of these resources are difficult in achieving high availability.

Hypervisor: A hypervisor is software, hardware or a firmware that provides virtual partitioning capabilities which runs directly on hardware. It is defined as the virtual machine manager which allows multiple operating systems to run on a system at a time providing resources to each OS without any interaction.

Hypervisor controls all the guest systems. As the operating system number increases managing is difficult these leads to security issues. If a hacker gets control over the hypervisor he can control the guest systems by knowing the behavior of the system which causes data processing damage. Advanced protection system is to be developed to monitor the activities of the guest Virtual machine [9].

II. CONCLUSION

To have physical and virtual controls in the cloud environment one must protect data by implementing strong encrypting techniques using secure connections and applying data loss prevention policies [10]. Access control policies are

to be established and client identities are to be checked. Datacenter platforms, infrastructure and client devices are to be secured by trusted computer policies. Enable secure migration from private cloud environment to public cloud providers. This paper discuss complete fast growing technology known as cloud computing. Cloud computing have large number of resources to distributes their resources on demand. Cloud computing provide all the computing related services through the internet. For storage there is data as a service, for application there is software as a service, for computing there is platform as a service and infrastructure as a service etc. However cloud computing have various advantages but there is also some of the critical issues which needs to resolve with urgency. One of the major issues of cloud computing is virtual machine migration from current host system to another system due to over loading or other resource utilization factor.

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Cite this article as :

Ramandeep Kaur, Sumit Chopra, "Virtualization In Cloud Computing : A Review", International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT), ISSN : 2456-3307, Volume 6 Issue 4, pp. 01-05, July-August 2020. Available at doi : https://doi.org/10.32628/CSEIT20641

Journal URL : http://ijsrcseit.com/CSEIT20641