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## VIRTUALIZATION IN CLOUD COMPUTING

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## Abstract
*Today the whole IT industry currently working on the hybrid solution of Virtualization and cloud computing. Virtualization and virtual environments are fundamental basics for data sharing in Cloud Computing. It is benefit for both the guest user and the provider: While it provides the first with the elements needed to execute his request, it gives the ability to be housing different guests with no additional cost. The main component in a virtual architecture is called hypervisor, having extra privileges, which makes it able to play fundamental role of managing the sharing of data and resources. This hypervisor has many advantages regarding the cost, the simplicity of execution, the availability. But in the other hand, the major role played by this makes it the perfect target for malicious users aiming to attack the virtual system.*

*Keywords: Cloud Computing, Virtualization, Applications, hypervisor.*
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## 1. INTRODUCTION

Ensuring the security of images delivered by virtual machines from the provider's server to the user's screen is one of the different various approaches developed to secure and ensure privacy of the cloud. In this paper, we will focus on this approach in order to provide deeper analysis of this solution and means of development. Virtualization in its very simplest, may be defined as the technology that gives a user the possibility to work on different environments using the same computer. Each virtual environment is prepared to ensure its own security and integrity, and to keep the safety of its data from other virtual machines running on the same physical environment, and from this environment itself. Cloud computing is a paradigm of a distributed computing to provide the customers on demand, utility based computing services. Cloud users can provide reliable, available and updated services to their clients in turn.
E.g. Amazon enables the users to handle very low level details whereGoogle App-Engine provides a development platform for the developers to developtheir applications. Cloud computing architecture addresses difficulties of large data processing.

### 1.1 What Is Cloud Computing?

Cloud computing is a form of Internet-based computing technology that provides shared computer processing resources and data to computers and other devices on demand. It is a model for on-demand access to a shared pool of configurable computing resources (e.g., computer networks, servers, storage, applications and services).

The origin term of the *cloud computing* is unclear. The word *cloud* is commonly used in science to describe a large or big collection of objects that visually appear from a distance as a cloud and describes any set of things .

### 1.2 What is virtualization?

In computing, **virtualization** refers to act of creating a virtual (rather than actual) version of something, including virtual computer hardware platforms, storage devices, and computer network resources.

Virtualization began in the decade of 1960s, as a method of logically dividing the system resources provided by mainframe computers between different applications. In computing, virtualization means to create a virtual version of the device or resource, such as a server, storage device, network or even an operating system

where the framework divides the resource into one or more execution environments.

Managing applications and distribution becomes a typical task for IT departments. Virtualization is a technology that is rapidly transforming the IT landscape and has changed the way people compute. It reduces the hardware utilization, saves energy and costs and makes it possible to run multiple applications and various operating systems on the same SERVER at the same time. It increases the utilization, efficiency and flexibility of existing computer hardware.
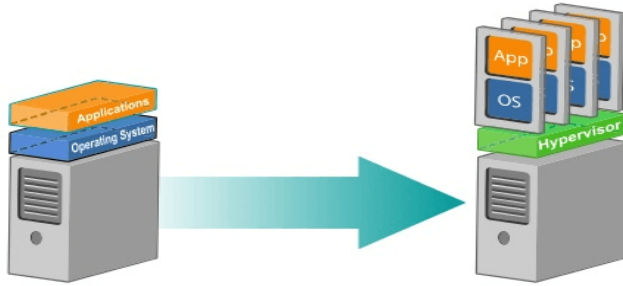


Fig.1.1 Virtualization process

There is a software which makes virtualization possible. This software is known as Hypervisor, also known as the virtualization manager. It sits between the hardware and operating system.
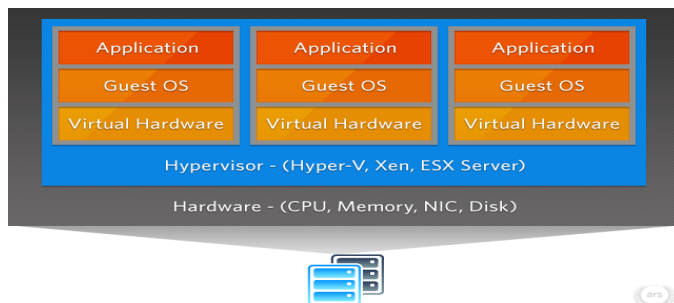


Fig 1.2.Virtualization includes Hypervisor

## 2. LITERATURE REVIEW

The word *cloud* is commonly used in the science to describe a large collection of objects that visually appear from a distance as a cloud and describes any set of things whose details are not further inspected in a given context.

Before the cloud computing, there was Client/Server computing which is basically a centralized

storage in which all software applications, all the data and all the controls are resided on the server side. If a

single user wants to access specific data or run a program then he/she need to connect to the server and then gain appropriate access, and then he/she can do his/her business. Then distributed computing came into picture, where all the computers are networked together and share their resources when needed. On the basis of above , there was emerged of cloud computing concepts that later implemented. Around 1961, John MacCharty suggested in a speech at MIT that computing can be sold like a utility, just like a water or electricity. It was a brilliant idea, but like all brilliant ideas, it was ahead if its time period, as for the next few decades, despite interest in the model, the technology simply was not ready for it. But of course time has passed and the technology get that idea and after few years mentioned that:

*In the 1999,* **Salesforce.com** *started delivering of applications to users using a simple website*. The applications were delivered to enterprises over the Internet, and this way the dream of computing sold as utility were true.*In 2002,* **Amazon** *started the Amazon Web Services*, providing services like storage, computation and even human intelligence. However, starting with the launch of the Elastic Compute Cloud in 2006 a truly commercial service open to everybody existed. *In 2009,* **Google Apps** *also started to provide cloud computing enterprise applications.*

All the big players are present in the cloud computing evolution, some were earlier, some were later. *In the 2009,* **Microsoft** *launched Windows Azure*, and companies like Oracle and HP have all joined the game. This proves that today, cloud computing has become mainstream.

## 3. APPLICATIONS

The world of cloud computing and software experiences an endless parade of new technologies, languages, and platforms. Such of them are

### 3.1. Docker

Docker is an open-source system of software containers. Containers help softwares to run while it is being moved from one environment to another,such as from a developer's computer to staging to production and have all of the things that are needed to run a program inside the container . The host, runtime, code, operating system, tools, libraries, and other components are all inside an isolated environment. Everything is self-contained, so programmers not have to worry about what flavor of Linux is being used wherever the application is being deployed at a given time. Simply put, it will work everywhere.

- Highly portable and able to run anywhere
- Lightweight and highly scalable

- Cost-efficient because their high-densities allow more containers to be placed on a single machine
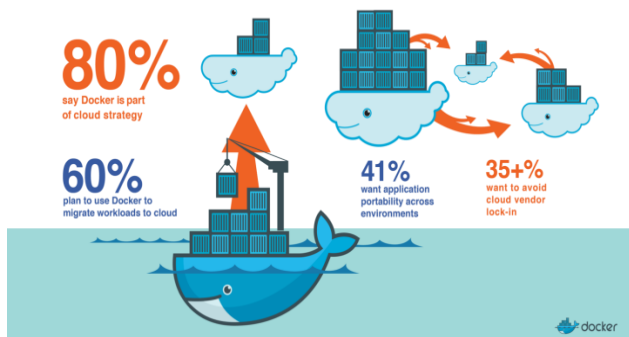- Easy to use in the clouds and on-premise



Fig.3.1 a Survey of Docker

### 3.2. Satori

Satori Software helps to organizations of all sizes solve complex data-related business challenges with simply powerful software, services and solutions. In fulfilling  company's mission to deliver an exceptional user experience, its data management, data quality and mailing preparation products set new standards for ease-of-use and functionality. Over 15,000 organizations from three-person catalog operations to Fortune 500 enterprises benefit from the Satori® solutions. A vendor of the choice for U.S. federal and state agencies, the company's customers include leaders in healthcare, financial services, education, direct marketing, fundraising and more. It founded in 1982 and a Neopost company since 2009, Satori Software is headquartered in Seattle, Washington.

Satori is the platform for any application with live data. Live data refers to the continually changing and instantly relevant content. Developers can use the Satori to write complex production applications without having to design and deploy their own servers. At the core of the Satori platform is  realtime messaging service (RTM) of publish-subscribe architecture.

### 3.3. Open Stack

OpenStack  is a free and open-source software platform for cloud computing mostly in as infrastructure-as-a-service (IaaS), whereby virtual servers and other resources are made available to customers. The software platform consists of the interrelated components that control diverse, multi-vendor hardware pools of processing, storage, and networking resources throughout a data center. Users either manage it through web-based dashboard, through command-line tools, or through  RESTful web services.

OpenStack began in the 2010 as a joint project of Rackspace  Hosting and NASA. As in 2016, it is managed  by  the OpenStack Foundation, a non-profit corporate entity established in September 2012to promote OpenStack software and its community. More than 500 companies have joined the project.
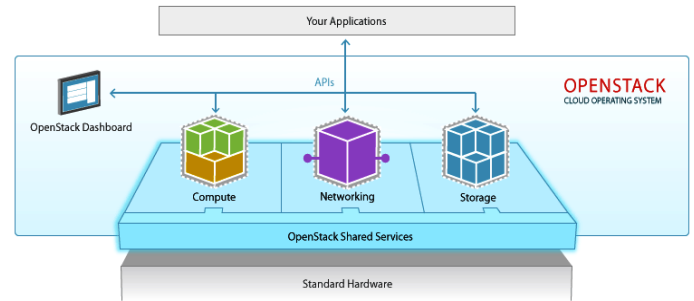


Fig 3.2 Open stack

## 4. ASSUMPTION & GOALS

In today's x86 computer hardware was designed to run a single operating system and a single application. Virtualization run multiple virtual machines on a single physical machine, with each virtual machine sharing the resources of that one physical computer across multiple environments.

**Top 5 reasons to adopt virtualization software:**

1. **Get more out of  existing resources**: Pool common infrastructure resources and break the legacy "one application to one server" model with server consolidation.

2. **Reduce the data center costs by reducing your physical infrastructure and improving your server to admin ratio**: Fewer servers and related IT hardware means reduced real estate and reduced power and cooling requirements..

3. **Increase availability of the hardware and applications for improved business continuity**: Securely backup and migrate entire virtual environments with no interruption in service

4. **Get operational flexibility**: Respond to market changes with dynamic resource management, faster server provisioning and improved desktop and application deployment.

5. **Improve the desktop manageability and security**: Deploy, manage and monitor secure desktop environments that users can access locally or remotely, with or without a network connection, on almost any standard desktop, laptop or tablet PC.

## 5. ADVANTAGES & DISADVANTAGES

### 5.1. Advantages

#### 1) Lower cost computer for users

In cloud, don't require a high-powered (and accordingly high-priced) computer to run cloud computing web based applications because applications run on cloud not on desktop PC or laptop.

## 2) Lower IT infrastructure cost

By using cloud computing, you need not to invest in a larger numbers of more powerful servers, you also need not to require the IT staff for handling such powerful servers.

## 3) Fewer maintenance cost

The maintenance cost in the cloud computing greatly reduces both hardware and software maintenance for organizations of all sizes.

## 4) Lower Software Cost

It reduces the software cost because don't need to purchase separate software packages for each computer in the organization.

## 5) Instant software updates

Another software-related advantage in cloud computing is that userdon't need to face with the choice between obsolete software and high upgrade costs. If the app is web-based, updates happen automatically and are available next time when the user logs in to the cloud.

## 6) Increased computing Power

The execution capacities of cloud servers are very high. It processes the application very fast.

## 7) Unlimited storage capacity

Cloud offers a huge amount of storage capacity like 2000 GB or more than that if required.

## 5.2. Disadvantages

## 1) Require a constant Internet Connection

Cloud computing is the impossible without Internet connection. To access any applications and documents need a constant Internet connection.

## 2) Require High Speed Internet connection

A low-speed Internet connection makes cloud computing painful  and often impossible. Web based apps often require a lot of bandwidth to download, as need to download large documents.

## 3) Stored Data Might Not Be Secure

In cloud computing, all your data is stored in the cloud. That's all well and good, but not secure in the cloud.

## 6. FUTURE SCOPE

Cloud Computing is a fast emerging business standard. Enterprises beneficial in several ways. Cloud Computing simplifies accessibility, virtual storage space, addresses backup issues, it provides security against unauthorized access and loss of data. Key advantage is that users can pay only for those resources they have used on 'the cloud' and do away with the major investments for data storage, software licenses, servers and hardware.According to an IBM statistic about 85% of new applications are being developed around Cloud Computing. The industry is expected to grow explicitly, driven mainly by the services that allow users to backup their files including photos and music, while ensuring easy availability of files in cases of hard drive crash. Studies by NASDAQ indicate that an investment in cloud technology is likely to expand over US$ 40 million by the year 2018.

## 6. CONCLUSION

Cloud Technologies are mostly virtualization environments. Aspirants seeking to make good in the Cloud need to adept in networking and virtualization and gain hands-on exposure with live deployments. People can also experiment with their Cloud Technology Skills on few websites that offer lab infrastructure such as Azure, AWS and Google Cloud among others.

The idea of hosting two different approaches in one single platform will be giving the users an on measure solution to answer to their security requests, and in the same time, the provider will not be losing resources in allowing users more than asked for performances. This hybrid approach needs a lot of improvements since the most important element on the solution, which is the status table.

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