Cloud and virtualization: The missing cloud in virtualization

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Abstract

Cloud computing and virtualization are two technologies today. The main concern of this paper is to explain the missing use of virtualization in the cloud. Virtualization is one of the fundamental technologies that make cloud computing to work. Virtualization is not cloud computing. This paper centers in automated virtualization as a cloud and also the missing virtualization in the cloud. When automation is engage with virtualization, it specified as a cloud that is the main focus of this paper. Cloud computing is as much as methodology as it is a technology. This paper described how virtualized environments are used in cloud based applications. Each has their own benefits and they are not competing approaches. Virtualization and cloud computing are both ways to do more with less by maximizing computing and infrastructure resources. We understand that these two technologies somewhere cannot separate from each other. Cloud comes with business need in any IT organization to manage business 1cost and faster availability of required infrastructure. It comes by implementing defined processes and services to meet the increasing demand by reduce time of availability.

Keyword: cloud, virtualization, organization, sever, automation

1.0 introduction

Virtualization refers to a process used to create a virtual environment. It allows a user to run multiple operating systems on one computer simultaneously. It is like getting multiple servers for each physical server you buy. It is creation of virtual version of something such ad an operating system, a desktop, a server or network resources. The technology behind virtualization is known as virtual machine monitor (VMM) or virtual manger.

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Virtualization is also known as the backbone of cloud computing virtualization is under the cover technology that decouples physical infrastructure from the service provided. It is core enabler of cloud computing [Anu Gupta, 2010], because abstracted in order to allow communication and control through a web service. Eg.., start a Php server at the URL www.myphpserver.com. Virtualization is a layer of software that lets companies consolidates several of their in-home servers onto a single piece of hardware (Anu and Garg, 2015).

Virtualization is a process in which software is used to simulate hardware. It can exist without the cloud. But cloud computing cannot exist without virtualization. Many organizations have deployed virtualization by creating virtual servers on top of networking, storage and security stacks.

Benefits of Virtualization as applied to the realm of cloud computing.

1.   Virtualization on small scale

2.   Increase power usage effectiveness

3.   Less redundancy

4.   High amount of work

5.   Higher availability

6.   Privacy

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Virtualization is one of the fundamental technologies that makes cloud computing work. Virtualization is not cloud computing it is the foundation for cloud but for virtualization alone (even an infrastructure that is 100% virtualized) does not make a cloud.

Cloud Computing

The NIST (National Institute of standards) define cloud computing as a model for enabling on-demand network access to a shared pool of resources that can be rapidly provisioned with minimal effort or interaction. The term cloud computing has become a buzzword in the technology industry, which refers to automated control, built on top of a virtualized infrastructure consisting of storage, computing and network components. Cloud computing gives your company access to complex applications and computing resources via the internet. Virtualization manipulates hardware and cloud computing manipulates the result. It is the delivery of shared computing resources, software or data as a service (SeaS) on-demand through the internet. Cloud computing is accessed through the internet and can make use of virtualization. Certain operating systems hardware systems and even application clusters, deliver cloud services. Cloud computing is nothing but delivery of computing resources, data and storage resources as a service to end users over a network. It set up as a virtual office that provides the flexibility of connecting your business anywhere any time.

Cloud computing is the name for the whole end to end package provided for a customer who wants to outsource their software, platform or

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infrastructure to someone who could provide these as a service. Server providers provide customers a way to access these servers in a secure, accountable, reliable, scable, monitored manner, usually on a pay per use basis. "cloud" means that things are hidden behind the scenes i.e. they are not transparent or they are cloudy – it is a form of abstraction so all the customers know is that they get the services they needed on demand, but they don't know the details of how it is being done (Anu and Grag 2015). It is common for cloud computing to be redundancy, high availability and even geographic redundancy. This also makes cloud computing very flexible. It is easy to add resources to your application. Cloud computing has been designed with scalability in mind.

The following are the benefits to moving your business to the cloud,

1.   Cost efficiency

2.   Scalability

3.   Backup and Recovery

4.   Unlimited storage

5.   Easily Deployment

2.0 Virtualization on a small scale

With virtualization, you can purchase and maintain fewer servers, and you can get more use out of the servers you already have. A virtualized server

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makes better use of the server's available capacity than a non-virtualized server. In addition, you can run more applications on each virtualized server. Virtualization software lets you divvy up the resources of a single physical server to create several separate virtual environments, called virtual machines. Each virtual machine can run its own operating system as well as any business applications your company needs.

Virtualization can also be applied to storage hardware, like server virtualization. Virtualization can help you get more out of your existing hardware by increasing its utilization, anywhere 20 to 80 percent. Storage virtualization pools all of your computing resources from various storage devices into a single, shared virtual storage repository that is available to everyone on the network, no matter where they're located.

When your servers and storage devices are running at their true capacity, you don't need to purchase new hardware as often. That can result in significant cost savings for your small business.

3.0 Cloud computing for big applications

For most small companies, cloud computing is a technology you'll access using the internet rather than implementing it on your own network. You can choose from a variety of cloud computing providers and cloud-based services all designed to meet small business needs. With cloud computing, you can implement an enterprise-grade application, such as customer relationship management (CRM), or service, like hosted voice over IP

(VoIP), or off-site storage the cost for which would typically exceed most small business budgets if it

Differences

1. Virtualization can make one computer perform like many separate computers and cloud computing allows many different companies to access one application.

2. Virtualization is employed locally while cloud computing is accessed as a service.

3. Virtualization is controlling the internal management of hardware and cloud computing, services are already taken care by the provider of your wide area network.

4. An automated cloud provides some billing system on monthly bases for charging the customer for the services being used. This is not applicable for virtualization.

5. Cloud computing has some well-designed user application interfaces for purchasing service from the cloud. Virtualization does not need any applications.

Similarities

1. Cloud and virtualization both operate on a one-to- many model.

2.   Cloud and virtualization both were developed to maximize the use of computing resources and reducing the cost of those computing resources.

4.0 Automated Virtualization

Virtual machines can be run on any virtualization enacted physical server, creating a pool of computer resources that helps ensure your highest-priority applications will always have the resources they need.

Virtualization allows companies to create scable infrastructure, where new VMs can be added without the need to continuously buy new hardware and other physical devices.

Virtualization however allows user to retain the one application per server architecture model while allowing them to run as separate virtue machine in the same piece of server hardware.

Since VMs are not attached to a physical computer. The VMs can be migrated (move) between servers while the system is still running. By having the ability to consolidate, users find they can buy and allocate the appropriate amount and energy consumption costs.

Virtualization software allows virtual machines to access physical hardware resources of the computer on which they resides. Having the ability to run multiple VMs on one physical computer allow for the optimization of server and workstation physical assets as most server based computer are significantly underutilized.

Virtualization provides features like high availability and fault tolerance to help improve uptime of the process system and therefore controlled application.

The most important is hardware independence. This independence is at the core of many of the benefits virtualization provides one of this most important, being the ability to extend the lifecycle of a centre system.

5.0 Clouds as Automation

Automation extends to the software layer, where complex system can be configured once and then rooted out on the fly as needed using cloud automation tools. Intelligent systems architecture can balance the load among computer, network or storage resources, bringing system online or offline as demand dictates. (Scott Johnson, 2013). Cloud automation is meant to alleviate the complexity that comes with cloud computing orchestration which is the deployment of the different resources and modules in a cloud computing or virtualized environment. Automation targets to make all events associated to cloud computing as fast, efficient and as laid back as possible through the use of various software automation tools which are installed directly on the virtualization platform or software and controlled via an in-built interface.

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The dynamic nature of cloud computing has pushed data center workload server, and even hardware automation to whole new levels. Any data center provider looking to get info cloud computing must look at some form of automation to help them be as agile as possible in the cloud world (Bill Kleyman 2013).

6.0 Virtualization is not cloud computing

Virtualization abstracts computer resources- typically as virtual machines (VMs) – with associated storage and Networking Connectivity. The cloud determines how those virtualized resources are allocated, delivered, and presented. Virtualization is not, necessary to create a cloud environment, but it enables rapid scaling of recourses in a way that non virtualized environment find hard to achieve.

7.0 Virtualization as an Enabling Technology.

The underpinning for the majority of high performing clouds in a virtualized infrastructure. Virtualization has been in data centers for several years as a successful IT strategy for consolidating servers. Used more broadly to pool infrastructure resources, virtualization can also provide the basic building blocks for your cloud environment to enhance agility and flexibility. Today, the primary focus for virtualization continues to be on servers. However, virtualization storage and network is emerging as a general strategy.

8.0 Technologies that Improve the Cloud and Virtualization

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After explaining what cloud and virtualization is. We come to main agenda of this paper that is how cloud and virtualization are complementing each other in industry. For that first of all we lighten up their differences and similarities. After that we will have a glance at how virtualization is enhancing cloud and vice versa. Even if there differences and similarities in cloud and virtualization technologies, many in the industry use them interchangeably. Following is the discussion, based on different criteria for both technologies.

Technology based: While virtualization may be used to provide cloud computing, cloud computing is quite different from virtualization. However, cloud computing can be better described as a service where virtualization is part of a physical infrastructure. Cloud computing may look like virtualization because it appears that your application is running on a virtual server detached from any connection to a single physical host, eg., the cloud vendor who is proving services has a single server and this server is virtualized in multiple.

Cost based: As we know cloud provides all the IT services and companies get rid of the cost establishing own data center. On the cloud vendor end virtualization further reduces cost of multiple servers by virtualization. So both cloud and virtualization are drastic cost efficient services. Virtualization is a technology that can increase efficiency in your data center and which might be leveraged by cloud providers as well. It can reduce the costs of hosting all your old stacks in the short term. Cloud on

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the other hand is a disruptive shift in the value propositioning of IT and the start of a prolonged disruption in the nature and purpose of businesses.

Architecture based: In essence cloud will enable organizations to share multi-tenant business capabilities over the network in order to specialize on their core value. Whilst virtualization can help you improve your legacy mess it does nothing significant to help you take advantage of the larger disruption as it just reduces the costs of hosting applications that are going to increasingly be unfit for purpose due to their architecture rather than their infrastructure.

9.0 Conclusion

Virtualization and cloud computing are also so closely connected because the major hypervisor vendors-WMware, Microsoft and Citrix systems- are putting a lot of emphasis on the cloud. They are closely aligned their products with tools and complementary technologies that promote the adaptation of private cloud computing. Cloud computing and virtualization are important concepts in today's business environment. We have seen how virtualized environments are used in cloud based applications. Each has their own benefits and they are not competing approaches. Virtualization and cloud computing are both ways to do more with less by maximizing computing and infrastructure resources. Virtualization allows server consolidating by hosting many servers on a simple piece of hardware where cloud computing is a service that delivers computer resources on a metered pay-as-you-go model.

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