

# Cloud Migration Technologies and Implementation

Madhuri Chopade<sup>a\*</sup>

<sup>a</sup>Assistant Professor, Gandhinagar Institute of Technology, Gandhinagar, Gujarat, India

---

## Abstract

Cloud migration is that the method of part or utterly deploying Associate in an organization's digital assets, services, Information Technology resources or applications to the cloud. The migrated assets square measure accessible behind the cloud's firewall. Cloud migration is additionally called business method outsourcing (BPO), which can entail migrating a complete structure infrastructure, wherever computing, storage, code and platform services square measure transferred to the cloud for access. Many organizations now not question the worth proposition related to cloud computing. However the speech has changed— from “Should we tend to bang?” to “How ought to we tend to do it to urge the foremost value?” Intel needs to assist you alter delivery of your cloud services so your business will notice the total advantages of cloud computing currently, whereas birthing the groundwork to maneuver to a additional elastic hybrid model at constant time. The aim of this guide is to assist you're taking the primary step—building a personal cloud on an extremely virtualized foundation.

*Keywords:* Cloud Computing, Migration, Virtualization.

---

## 1. Introduction

Cloud migration generally involves moving knowledge or alternative business parts between cloud environments that is thought as cloud-to-cloud migration. The method of transitioning to a different cloud provider is referred to as cloud service migration. In any case, productive migration to a service provider's atmosphere might need the utilization of middleware, like a cloud integration tool, to bridge any gaps between the vendor's and also the customer's (or alternative vendor's) technologies.

Transitioning to the cloud or between cloud environments presents the same old IT problems, however the issues square measure combined by having knowledge keep and managed remotely, by external organizations and infrequently in multiple locations. Among these problems square measure special concerns for privacy, interoperability, knowledge and application movableness , knowledge integrity, business continuity, and security.

Regardless of structure size, one among the concerns is whether or not the workloads; targeted for cloud migration have been virtualized. In some cases, it's a lot of easier to maneuver workloads to the cloud if on-premises servers have already been virtualized. In fact, some suppliers can permit a corporation to port virtual machines on to the cloud. If on-premises servers haven't been virtualized, a migration to the cloud is probably going still attainable, however the method might involve a lot of work.

### 1.1 Virtualization Technologies

- **User State Virtualization:** There's forever a risk inherent in business-critical information being hold on end-user machines. If a machine is lost, taken or broken, the value in lost information and productivity usually way exceeds the worth of the machine itself. Through user state virtualization (USV) technologies, like Roaming Profiles and Folder Redirection, you'll be able to make sure that all user information is hold on centralized servers wherever you'll be able to back it up and defend it on an everyday basis. USV conjointly offers your users the convenience of having the ability to access their information from any digital computer. Their personal settings and information also are seamlessly offered on any new machine or in any new location.
- **Application Virtualization:** Deploying, managing and maintaining line-of-business applications will be one in every of the foremost expensive and long aspects of shopper computing. However Microsoft Application Virtualization (App-V) permits you to virtualized applications, as well. This helps you package, deploy and maintain applications during a centralized and efficient means. App-V lets your users access any approved application from any approved device.
- Combined with USV, App-V permits you to deliver a seamless end-user expertise, whereas streamlining software package maintenance and licensing practices.

---

\*Madhuri Chopade

*Email address:* madhuri.chopade@git.org.in

- OS Virtualization: Just as you'll virtualize a whole server surroundings, you'll conjointly deliver an entire desktop computing expertise. mistreatment Virtual Desktop Infrastructure (VDI) and Remote Desktop Services session virtualization, you'll provide your users anyplace access to a personalized, on-demand desktop computing surroundings, complete with their own applications and information. When you add RemoteFX, introduced with Windows Server 2008 R2 SP1, VDI becomes a full-fidelity expertise. RemoteFX provides you a 3D virtual adapter, intelligent codecs and therefore the ability to airt USB devices inside VMs. There are solutions like Microsoft Enterprise Desktop Virtualization, or MED-V, that uses virtualization technology to assist mitigate application-compatibility problems on the desktop, removing barriers to OS upgrades.

## 2. Benefits of Cloud Virtualization

### 2.1 Reduce Infrastructure Cost

Resource Migration into the cloud—particularly public cloud computing, wherever a hosting company provides shared or dedicated hardware—delivers a major bottom-line reduction in cost. In different words, you don't ought to obtain the maximum amount computing hardware. You ought not to power, manage or maintain it on-premises. After you examine the full value relative to computing power delivered, virtualization offers vital value advantages as a results of shared resources and elastic quantifiability. These value savings are often a boon to your budget, significantly in tough economic conditions.

### 2.2 Elastic Scalability

When conducting capability coming up with and analysis, we regularly style IT infrastructure for the “worst case”—laying out design capable of handling the best attainable load underneath the worst attainable conditions. For instance, you would possibly style your internet infrastructure to be capable of handling your on-line retail traffic and dealings load throughout the end-of-year season. Does one actually need to manage and maintain servers sufficient to serve that capability all year round?

Migrating those temporary workloads to the cloud permits you to get pleasure from the elastic measurability of virtualization. You'll be able to add extra capability whenever you would like it, and simply and cleanly recall it once you don't. The bulk of cloud answer suppliers charge on a pay-for-use basis, thus this will additionally deliver a big profit to your bottom line by reducing your prices throughout lower-utilization times.



Fig. 1. Cloud Migration

### 2.3 Redundancy and Reliability

You have to confirm your technology systems meet the wants of your users. That's your primary mission. Your advanced systems can, at some purpose, encounter instability. Whether or not your hardware fails, your network affiliation drops or your data center goes down in severe weather, there'll be problems.

Virtualization offers you a further layer of flexibility to quickly answer these challenges. Vital business systems are self-contained among their virtualized surroundings, therefore you'll simply replicate them to multiple physical locations or

migrate them to new hardware any time. This provides you improved responsibility by eliminating failure points. It conjointly enhances your disaster recovery designing efforts.

#### *2.4 Reduce your Data Center Cost*

There are some workloads you'll want to maintain and run in your own data center. Whether you prefer to maintain exclusive possession of your data or implement custom solutions, or because the cost/benefit analysis simply tips in favour of keeping it in-house, there are good reasons to continue to operate and manage your own applications and servers.

Fortunately, doing so doesn't necessarily deprive you of the benefits of the cloud. You can still adopt a cloud-like architecture in your own data center. This concept is known as a "private cloud." There are a number of different ways you can leverage virtualization technology and private cloud architecture to help realize the most value from your infrastructure investment.

### **3. Steps to implementation of Cloud Virtualization**

#### *3.1 Implementation of Virtualization*

Virtualization is that the foundation for Associate in agile, ascendable cloud—and the primary sensible step—for building cloud infrastructure. Virtualization abstracts and isolates the underlying hardware as virtual machines (VMs) in their own runtime setting and with multiple VMs for computing, storage, and networking resources in an exceedingly single hosting setting. These virtualized resources square measure crucial for managing information, moving it into and out of the cloud, and running applications with high utilization and high availableness. The hypervisor is a virtual operational platform that executes the guest software for Associate in nursing application. Host servers square measure designed to run multiple VMs sharing multiple instances of guest operational systems.

#### *3.2 Select Your Cloud Management Platform*

With enhanced virtualization infrastructure, you furthermore may would like bigger management capabilities, a technical challenge which will be achieved in parallel to your transition to a cloud setting. At this juncture you'll be able to decide to:

- Use a virtualization management platform which will even be used or extended simply for the cloud.
- Augment existing tools with associate degree enlarged set of cloud management capabilities on high of your existing virtualization management platform.
- Add a brand new cloud management platform (CMP) which will run the cloud and your existing virtualization setting.

A cloud management platform is integrated package that delivers service quality, security, and accessibility for workloads running in cloud environments. CMP offerings vary wide in terms of platform maturity, design quality, and capabilities. At minimum, it ought to provide:

- Direct user access to the system
- Self-service capabilities and interfaces
- Workflow engine
- Automated provisioning
- Metering and chargeback practicality

#### *3.3 Automate Workflows and Other System Capabilities*

Automation is a key capability of elastic, high-performing cloud environments. By eliminating or minimizing manual processes and requiring minimal human control points, you can optimize and manage resources faster, deliver services, manage service life cycle, and respond to changing conditions. In a cloud environment, automated workflows integrate across heterogeneous and disparate systems that manage provisioning, scaling, VM configuration, identity and access controls, network resources, workflow monitoring, patching, and backup. More advanced automation capabilities can include release management, load balancing, firewalls, and management of more complex VMs.

#### *3.4 Orchestrate Services End to End*

Orchestration software system provides the machine-controlled intelligence that dynamically arranges, coordinates, and manages the weather of your cloud surroundings. Orchestration of end-to-end services permits the flexibility, economy of scale, and on-demand delivery for virtualized resources and provides the benefit and convenience users expect once they access the cloud.

Orchestration has 2 main jobs: positioning service requests with on the market resources and observation the health of the physical and virtualized surroundings. These functions alter your cloud to scale up or down supported demand at specified performance levels. To accomplish this, orchestration manages across totally different systems to:

- Connect and modify workflows to deliver a such that service.
- Manage configuration, capacity, metering, and chargeback.
- Track and report on cloud performance and accessibility.
- Monitor and manage power, together with energy consumption and cooling necessities.
- Monitor security threats and adherence to security policies, together with access, authorization, and identity management.
- Take effective actions and build changes supported feedback from watching tools.
- Predict potential problems so that they is addressed before they become major problems.

#### 4. Conclusion

As cloud computing is advance technology, to move data from two different cloud we need migration technology. There are so many migration technology available but in this paper we have implemented cloud using os virtualization. In future we want to implement cloud migration using virtualization.

#### References

1. Buyya, R., Yeo, C., Venugopal, S., Broberg, J., Brandic, I.: Cloud computing and emerging IT platforms: Vision, hype, and reality for delivering computing as the 5th utility. *Future Generation Computer Systems* 25(6) (June 2009) 599–616.
2. Nagarajan, A.B., Mueller, F., Engelmann, C., Scott, S.L.: Proactive fault tolerance for HPC with xen virtualization. In: *ICS '07: Proceedings of the 21<sup>st</sup> Annual International Conference on Supercomputing*, New York, NY, USA, ACM (2007) 23–32.
3. H. Erdogmus, "Cloud Computing: Does Nirvana Hide behind the Nebula?," *IEEE Software*, vol. 26, 2009, pp. 4-6.
4. M. Armbrust, A. Fox, R. Griffith, A. Joseph, R. Katz, A. Konwinski, G. Lee, D. Patterson, A. Rabkin, I. Stoica, and M. Zaharia, "Above the Clouds: A Berkeley View of Cloud Computing.," 2009.
5. M.A. Vouk, "Cloud computing issues, research and implementations," 30th International Conference on Information Technology Interfaces (ITI 2008), Cavtat /Dubrovnik, Croatia: 2008, pp. 31-40.
6. Khajeh-Hosseini, Greenwood, D.; Sommerville, I." Cloud Migration: A Case Study of Migrating an Enterprise IT System to IaaS", *IEEE*, July 2010, 450-457.
7. Kejiang Ye, Xiaohong Jiang ; Dawei Huang ; Jianhai Chen ; Bei Wang., " Live Migration of Multiple Virtual Machines with Resource Reservation in Cloud Computing Environments", *IEEE*, July 2011,ISSN: 2159-6182, 267 – 274.