A Study of Hybrid Clouds with in Multicloud

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Abstract

Hybrid cloud is a cloud computing environment which uses a mix of on-premises, private cloud and third-party, public cloud services with arrangements between the two platforms. Multi-cloud strategy is the concomitant use of two or more cloud services to minimize the risk of widespread data loss or downtime due to localized component failure in a cloud computing environment. Such a failure can occur in hardware, software, or infrastructure. A multi-cloud strategy can also improve overall enterprise performance by avoiding vendor lock-in and using different infrastructures to meet the needs of diverse partners and customers. This paper concentrates upon the recent trends in Hybrid cloud and Multi-cloud. Some light is also thrown in to the feature scope of this concept where Hybrid cloud, Multi-cloud beckons the researchers.

Keywords—Multicloud, Cloud Computing Hybrid Cloud, SaaS, IaaS, PaaS

1. INTRODUCTION

The cloud symbol is typically used to represent the internet. A cloud refers to a distinct IT environment that is designed for the purpose of remotely provisioning scalable and measured IT resources. It is commonly used to describe the delivery of software, infrastructure and storage services over the internet. The technology of distributed data processing in which some scalable information resources and capacities are provided as a service to multiple external customers through internet technology.

Cloud computing basics concept includes Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) [3][6]. In SaaS the service provider hosts the software and its main characteristics are no need to install it, manage it, or buy hardware for it. In PaaS an integrated platform for development, deployment, testing and web-applications. In IaaS a computer infrastructure, typically presented in the form of virtualization [1][8]. The deployment models

in cloud computing: Public cloud, community cloud, Private cloud and Hybrid cloud.

- Public cloud

This is used by anyone and everyone. It is open use for individuals and companies. Providers offer free and paid models, storage and computing. Drop box is the example for public cloud.

- Community cloud

This is for exclusive use by group of users. Users share mission or regulation. Healthcare, Financial, Law or Legal, Education and Energy.

- Private cloud

In private cloud the infrastructure is provisioned for exclusive use by single organization. It may be owned, managed, and operated by the organization.

- Hybrid cloud

The cloud infrastructure is a design of two or more distinct cloud infrastructures private, community, or public

2. HYBRID CLOUD

In order to understand what hybrid cloud its first important to understand the underlying components that make up the cloud in a standard traditional IT model the enterprise manages and controls the network connections to the private or public [6].

- Application
- Data
- Runtime
- Middleware
- Operating system
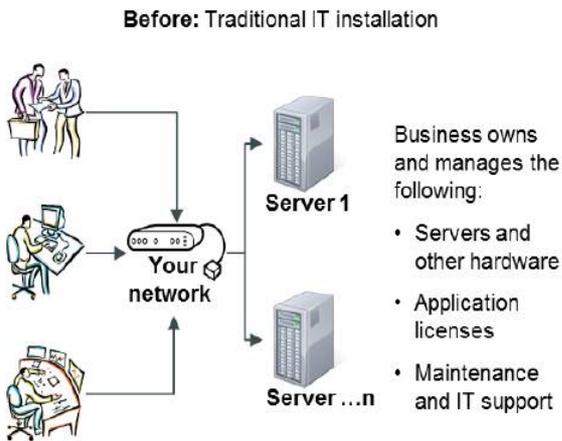- Virtualization
- Hardware
- Storage
- Internet

Figure 1: Traditional IT model

If the company is using IaaS they are only managing the operating system, middle ware, runtime, data and application [1][5]. The public cloud provides choices in terms of operation system that the enterprise gets to choose Linux or Windows.
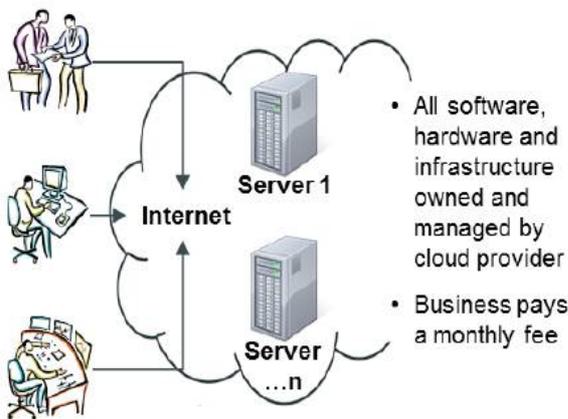

Figure 2: IT implementation model

PaaS the enterprise only manages the data and the application layer [2]. The PaaS provides everything else SaaS provides whole bundle completely listed above.

2.1 Difference between Private and Public Cloud

A public cloud provider makes resources available to the public for feet anybody can leverage the resources for their own use, it unrestricted [1][3][9]. Public cloud is connected to the public internet for anyone to leverage. In a private cloud environment the same capability are controlled by the enterprise in their own hosted environment for their own use only these environments can be connected to end users over a private line [3].

Figure 3: (a) Public cloud (b) Private cloud (c) Hybrid cloud

Public cloud tend to be cheaper because they are using shared infrastructure and more suited for applications whose information is not private proprietary or sensitive. Private clouds on the other hand are more expensive but offer a trade-off of higher levels of security and potentially hit higher SLA metrics [8][12]. The trade-off is strictly a business decision by the cloud buyer but in general most companies use public cloud today from test for development applications, email and CRM. Now a day's companies are more and more using public cloud for other business process such as HR and Accounting [4].

2.2 Driving Hybrid cloud computing

A few years ago, the IT world was focused on public cloud computing. After IT directors expressed concerns over public cloud security issues, the focus shifted to private clouds. And now, because everyone wants operational flexibility, hybrid clouds are at top of the wish list [6] [11]. Hybrid cloud is powered by the desire to take advantage of public and private cloud benefits in a seamless manner [6].
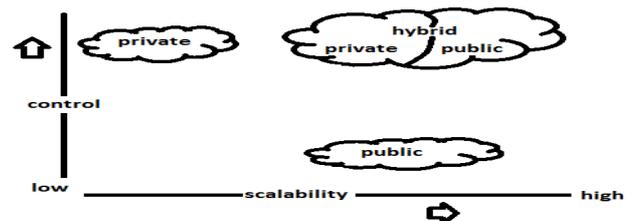

Figure 4: analyzing Private, Public and Hybrid cloud

In Public cloud the benefits are low investment and good test or development environment for applications that scale to many servers [12]. Public cloud risks are IT organization retains control over data center and security concerns: multi-tenancy and transfer over the internet.

In private cloud benefits are fewer securities as existing data center security stays in place and IT organization retains control over data center [2] [3]. Private cloud risks are high investment problem in providing cloud implementation, new operational processes are required; old processes not all suitable for private cloud.

3. MULTI CLOUD

The term "multi-clouds" is similar to the terms "inter clouds" or "cloud-of-clouds". Multi-cloud strategy is the use of two or more cloud to minimize the risk of service availability failure, corruption of data and loss, loss of privacy, vender lock-in and possibility of malicious insiders in the single cloud [3]. Recent research has focused on the multi-cloud environment which control several clouds and avoids dependency on any one individual cloud [6].

3.2 Build and Managing the Hybrid Cloud Model

Build, manage, and govern cloud ecosystem while retaining control IT environment and send non-mission-critical workloads to the public cloud to take advantage of its flexibility and scalability [2] [8] [11].
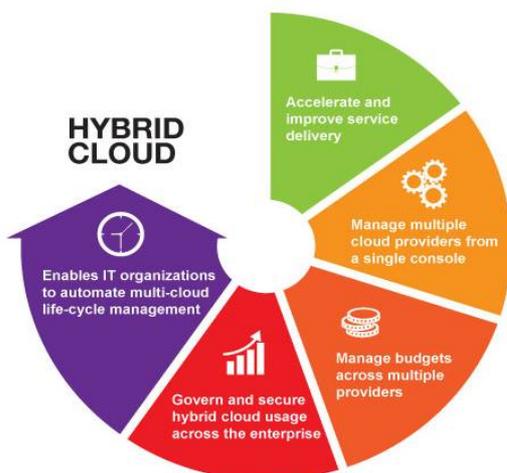
Figure 5: Hybrid cloud management

Achieve greater flexibility and choice for IT when deploying and managing a multi-cloud environment, by using self-service capability and governance to avoid vendor lock-in.
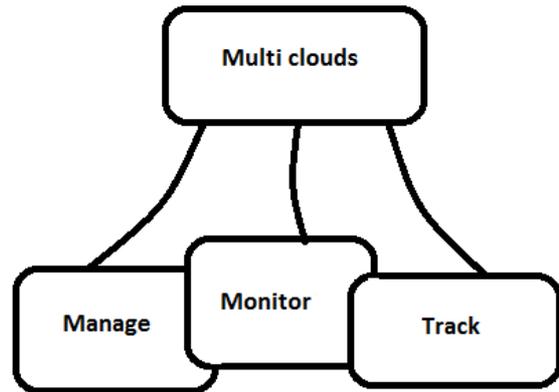
Figure 6: Managing multi-Clouds

Managing multi-cloud delivers the 1) Automate multi-cloud services management and delivery. 2) Monitor usage, performance, and costs across multi-cloud environments. 3) Track cloud services (SaaS, IaaS), costs, and billing in multi-cloud environments. 4) Aggregate services across multiple cloud domains [2].

3.3 Backup in Hybrid Cloud

Hybrid cloud is an ideal operating model for disaster recovery. That is, a hybrid cloud that is a seamless extension of the data center [6]. For small and medium sized enterprises that simply cannot afford enterprise-class disaster recovery or larger enterprises that want a more efficient or supplemental level of protection, the hybrid cloud is the optimum operating model [9].

Cost-effectiveness of online backup between data centers, tape backup no longer makes sense in the cloud. The cost-effectiveness and recovery speed of online, offsite backup makes it difficult to justify tape backup [8]. Smart data center operators are providing full disaster recovery services that not only replicate the servers between data centers, but also replicate the entire network configuration in a way that recovers the network as quickly as the backed up cloud servers.

4. ANALYSIS OF HYBRID CLOUD

4.1 Significant growth in Hybrid Cloud

There is strong growth in hybrid cloud adoption as public cloud users added private cloud resource pools. 77percent of respondents are now adopting private cloud up from 63 percent last year. As a result, use of hybrid cloud environments has grown to 71 percent [8].
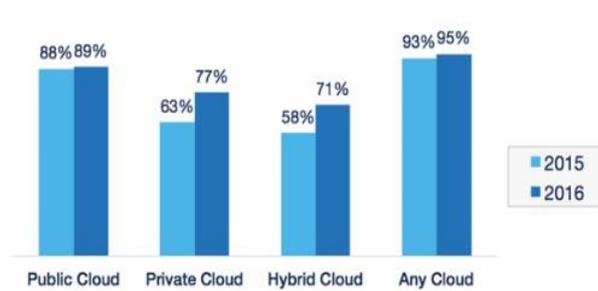
Figure 7: survey on cloud computing

The analysts forecast the global hybrid cloud services market to grow at a CAGR of 19.8 percent during the period 2016-2020.

4.2 Multi-cloud Strategy

82 percent of enterprises have a hybrid cloud strategy, holding steady from 2015 [4]. Private cloud adoption increased from 63 percent to 77 percent, driving hybrid cloud adoption up from 58 percent to 71 percent year-over-year. 95 percent of organizations surveyed are now running applications or experimenting with IaaS.
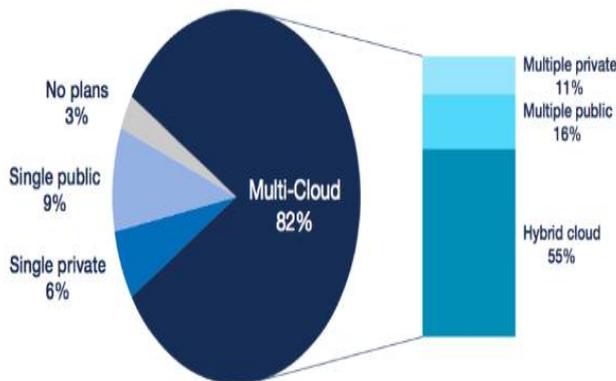

Figure 8: Enterprise Multi Cloud Strategy

5.Conclusion

It is clear that although the use of cloud computing has rapidly increased; cloud computing service is still considered the major issue in IT world and cloud computing environment. Customers do not want to lose their valuable private information as a result. The purpose of this work is to survey the recent research on hybrid cloud and multi-clouds to address the service and solutions. We have found that much research had been done to ensure the service of hybrid cloud and multi-cloud. We support the migration to multi-clouds due to its ability to decrease security risks that affect the cloud computing user.

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