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Private Vs Public Cloud

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Abstract

The main objective of the Private Cloud Hosting platforms is to optimize IT resources involved in the cycle of corporate provisioning, delivery, monitoring and control of business-critical applications: the elasticity of supply storage, processing and networking, on-demand access to systems, self-provisioning by the user or workgroup, through a centralized management dashboard unified system administrators, workgroup managers and end users. The decision to pursue cloud computing is one that many organization have or will make as this technology grows and matures. But this decision need not be one fraught with uncertainty. With a little due diligence, and answering a few key questions, you can ensure that your cloud vendor selection is a sound one. Nature of public cloud architecture depends upon sharing and accessing data within inhouse It premises as well as third parties. Although, this type of cloud form does raises an alarm in terms of security, but is equally efficient like private cloud architecture. Factors like scaled up environment and bandwidth uptime is also catered in this type of cloud form.

Keyword: - Public, Hybrid, Offline, Platform.

1.0 What is Cloud Computing?

Cloud computing broadly describes off-premise, ondemand computing where the end-user is provided applications, computing resources, and services (including operating systems and infrastructure) by clouds services provider via the Internet. The hosting industry came out of the need for software and computing services that were managed internally, but were made more economical and accessible through the economies of scale of a hosted implementation.Cloud computing as a computing model, not a technology. In this model "customers" plug into the "cloud" to access IT resources which are priced and provided "on-demand". Essentially, IT resources are rented and shared among multiple tenants much as office space, apartments, or storage spaces are used by tenants. Delivered over an Internet connection, the "cloud" replaces the company data center or server providing the same service. Thus, Cloud Computing is simply IT services sold and delivered over the Internet[9,8].

2.0 CLASSIFICATION OF CLOUDS:-

Cloud Computing can be classified into 4 types on the basis of location where the cloud is hosted:

- Public Cloud: Computing infrastructure is hosted at the vendor's premises. The customer has no visibility over the location of the cloud computing infrastructure. The computing infrastructure is shared between organizations.
- Private Cloud: Computing architecture is dedicated to the customer and is not shared with other organizations. They are expensive and are considered more secure than Public Clouds. Private clouds may be externally hosted ones as well as in premise hosted clouds.
- Hybrid Cloud: Organizations host some critical, secure applications in private clouds.

The not so critical applications are hosted in the public cloud. The combination is known as Hybrid Cloud. Cloud bursting is the term used to define a system where the organization uses its own infrastructure for normal usage, but cloud is used for peak loads.

- Community Cloud: The cloud infrastructure is shared between the organizations of the same community. For example, all the government agencies in a city can share the same cloud but not the non government agencies.

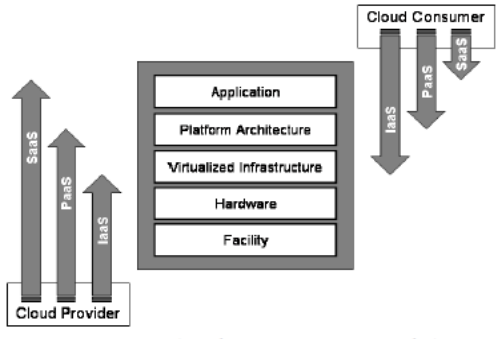

Figure2.0 Cloud Computing Models

3.0 Public Cloud Vs Private Cloud

- Public cloud is used as a service via Internet by the users, whereas a private cloud, as the name conveys is deployed within certain boundaries like firewall settings and is completely managed and monitored by the users working on it in an organization.
- Users have to pay a monthly bill for public cloud services, but in private cloud money is charged on the basis of per GB usage along with bandwidth transfer fees.
- Public cloud functions on the prime principle of storage demand scalability, which means it requires no hardware device. On the contrary, no hardware is required even in private cloud, but the data stored in the private cloud can only be shared amongst users of an organization and third party sharing depends upon trust they build with them. It is also entirely monitored by the business entity where it is running.

The following diagram reviews the differences between public and private clouds:

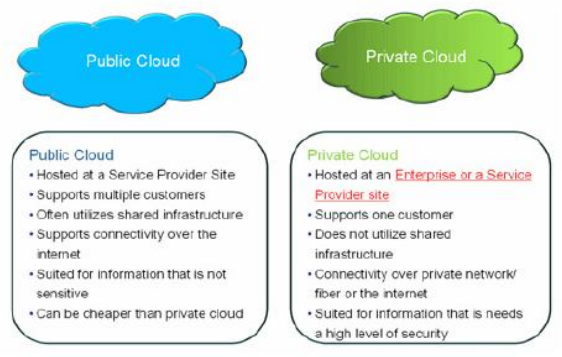

Figure 3.0 Comparisons between Public and Private Cloud [3]

Any enterprises are beginning their cloud evaluation with a "private cloud." I extend the definition of private cloud to be a "single tenant" cloud, as some enterprises may chose to use a single tenant cloud hosted at a service provider, versus hosting their cloud within their own data centers. In the following diagram, we show two private clouds, connected via policy-based replication in two data centers. This provides the assurance of backup and disaster recovery that many enterprises require. A third location could easily be added for even higher levels of backup and disaster recovery.

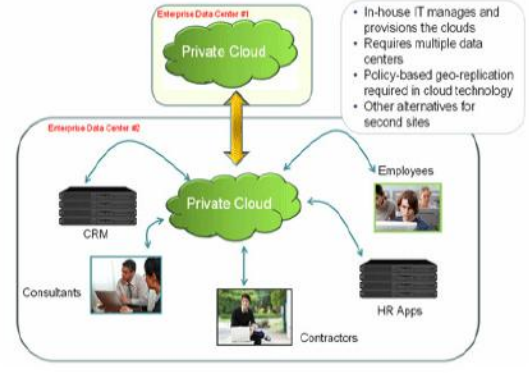

Figure3.1 Private Cloud inside an Enterprise [3]

The growth of storage is driving increased costs, and the enterprise is on a continuous search to improve the way they can cost-effectively manage this growing data. The primary difference between hybrid cloud and private cloud is the extension of service provider-oriented low cost cloud storage to the enterprise. The service provider based cloud may be a private cloud

(single tenant) or a public cloud (multi-tenant). There are several implementations of hybrid cloud, and several examples are included. The service provider cloud may enable enterprises to leverage the volume efficiencies of the service providers to realize additional savings. The private cloud, or enterprise cloud, is where the infrastructure is created or set up solely for one organization. Management of the infrastructure can be done in the comfort of the site of the organization itself. But if the company chooses, it can also be managed offsite, either as a hosted or managed cloud, by a service provider. Public cloud, on the other hand, is the type of infrastructure that serves a number of tenants. Most of the tenants are small scale businesses and the general public. The ownership of the resources is in the hands of the business that sells the service. When it comes to privacy and security, it is the private cloud that works best. One can be sure that all data and information are secure. This is especially great for companies that do specialized research and development or those that work for the government. Furthermore, additional security measures may be installed. Also companies with huge databases can greatly benefit from using the private cloud. On the issue of scalability, the public cloud is more efficient. Unlike the private cloud whose scalability potential is restricted or limited due to the company's limited emises, the public cloud shares more common resources which make it more scalable. The client business does not have to worry about additional servers as this is the job of the provider. Virtualization knowledge is another issue to consider. Though there have been attempts at creating a company's own private cloud, the problem comes in when there is the lack of expertise and experience of the employees. The staff that handles this area should be knowledgeable. This is not a problem for the public cloud. Another important consideration is pricing. The private cloud is, obviously, more costly that the other one. If the company does not need the advanced security features and network latency, then the public cloud will do as it is more affordable. And for now, what is most necessary to do for companies is to start transferring their files to the cloud and be able to compete with the rest of the business world. The majority of public cloud deployments are generally used for web servers or development systems where security and compliance requirements of larger organizations and their customers is not an issue. Private cloud computing, on the other hand, by definition is a single-tenant environment where the hardware, storage and network are dedicated to a single client or company. The public cloud is defined as a multi-tenant environment, where you buy a "server slice" in a cloud computing environment that is shared with a number of other clients or tenants.

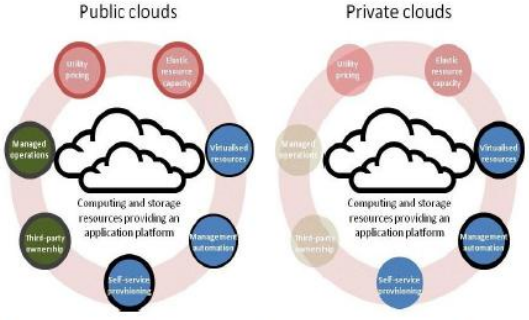

Figure 3.2 Views about Public and Private Cloud

3.1 PUBLIC CLOUDS AMAZON EC2 AND ACKSPACE CLOUD TRADEOFFS [1, 2]

- Utility Model – Public Clouds typically deliver a pay-as-you-go model, where you pay by the hour for the computer resources you use. This is an economical way to go if you're spinning up & tearing down development servers on a regular basis.
- No Contracts – Along with the utility model, you're only paying by the hour – if you want to shut down your server after only 2 hours of use, there is no contract requiring your ongoing use of the server.
- Shared Hardware – Because the public cloud is by definition a multi-tenant environment, your server shares the same hardware, storage and network devices as the other tenants in the cloud. Meeting compliance requirements, such as PCI or SOX, is not possible in the public cloud. No Control of Hardware Performance – In the public cloud, you can't select the hardware, cache or storage performance (SATA or SAS). Your virtual server is placed on whatever hardware and network, the public cloud provider designates for you.
- Self Managed – with the high volume, utility model, self managed systems are required for this business model to make sense. Advantage here for the technical buyers that like to setup and manage the details of their servers. Disadvantage for those that want a fully managed solution.
- The majority of public cloud deployments are generally used for web servers or development systems where security and compliance requirements of larger organizations and their

customers is not an issue. Private cloud hosting, on the other hand, by definition is a single-tenant environment where the hardware, storage and network are dedicated to a single client or company.

3.2 PRIVATE CLOUD COMPUTING TRADES-OFFS: [2]

- Security – Because private clouds are dedicated to a single organization, the hardware, data storage and network can be designed to assure high levels of security that cannot be accessed by other clients in the same data center.
- Compliance – Sarbanes Oxley, PCI and HIPAA compliance cannot be delivered through a public cloud deployment. Because the hardware, storage and network configuration is dedicated to a single client, compliance is much easier to achieve.
- Customizable – Hardware performance, network performance and storage performance can be specified and customized in the private cloud.
- Hybrid Deployments – If a dedicated server is required to run a high speed database application, that hardware can be integrated into a private cloud, in effect, hybridizing the solution between virtual servers and dedicated servers. This can't be achieved in a public cloud.

3.2 CHALLENGES OF A PRIVATE CLOUD [1]

There are a few constraints and challenges that would make the public cloud model more appealing to a lot of organizations. There are inherent challenges with private cloud that need to be addressed before an organization can venture down the path of building one.

1. Upfront Capital Cost: One of the drawbacks of private clouds is that organizations still need to buy, build and manage the cloud infrastructure, which defeats the primary premise of cloud computing. One of the key value propositions of cloud computing is that it drastically reduces the upfront capital cost of in-house infrastructure, while providing the same or better service for a simple recurring operational cost. This benefit cannot be realized with private cloud infrastructures.
2. Time and Resources: Not all organizations have the time or resources with in-house expertise to build the infrastructure and automation required to stand up and operate a private cloud. Case studies show that it involves much up-front investment in time and resources compared to simply going with a public cloud. However, there are many up and coming startups that are offering private cloud related services and products that organizations can use in their internal data center. While these products still need time to mature and become mainstream, this represents a significant shift towards the availability of the technology required to install and manage private cloud computing infrastructures. These product and service offerings could mitigate some of the risks and challenges and blur the line between a private and public cloud.
3. Size of the organization: Not all organizations can afford to build a private cloud for the two reasons listed above. Crafting a business case for building a private cloud for a smaller organization is difficult, since building the in house infrastructure for the private cloud does not provide as much of a return on investment as larger cloud deployments do. The public cloud provides impressive benefits related to economies of scale, and smaller organizations will find it difficult to build a private cloud solution that can match that.

CONCLUSION

A private cloud, because it functions independently for an organization and that too behind firewall settings does prove to be accessible. By stating this, we mean that a private cloud cannot be accessed from anywhere and at any point of time. It is completely managed by the users working for an organization. Public cloud architecture is built with the view to create an accessible business environment that can be shared and accessed from anywhere and at any time of the hour. Even though, it poses security risks, public cloud is considered more useful than its counterpart because of several reasons, Initial cost is minimal, but if data is stored for a long period of time, it proves to be expensive. However, the cloud acts as an excellent source for different types of data than a particular type of it. More accessible than the private cloud as it can be accessed from anywhere round the globe. Availability and reliability are the two factors that make public cloud computing service more popular. The reason being, it is available to users via web installed at a

given server off-premises. Public cloud's advantage includes low upfront cost, with practically infinite scalability, it has a significant downside especially in accountability, security, and lock-in.

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