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White Paper

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Cloud vs. Virtual Computing

“Cloud computing” has become one of today’s most popular buzz words. It’s showing up everywhere including TV commercials, advertising billboards, and especially among innovative software vendors. The reason: Cloud computing holds tremendous promise.

Cloud computing is a paradigm shift in many areas of the computing world. Other terms often used to describe Cloud computing are PaaS (**P**latform **a**s **a** **S**ervice), SaaS (**S**oftware **a**s **a** **S**ervice), and **V**irtual **M**achine (VM) Hosting. However, there are stark differences in many of these technologies. Acquiring an understanding of them is essential for consumers and can be mission critical.

The major players in Cloud computing are Amazon, Google, and Microsoft. Each of the offerings that these corporations supply can be categorized as running on a true, enterprise level, Cloud computing platform even though each offering is vastly different. Other offerings that use private cloud platforms or other virtual platforms (e.g., hosted systems typically hosting VMs), can be categorized as running on virtualized computing platforms. One reason behind this categorization is because these platforms often offer a variety of security features. However, it is important to take note that there is a significant difference between the true Cloud platforms and the virtualized platforms. True enterprise-level Cloud offerings consist of large scale infrastructure, highly advanced replicating technologies as well as load balancing, dynamic resource allocation, and much more. Virtualized or private cloud offerings typically do not offer these very crucial features.

An example of a true enterprise-level Cloud offering is the Windows Azure platform. When a software application is hosted on the Azure platform, all transactions are performed in triplicate by default. What this means is that three copies of each transaction are saved and delivered to the system. A process known as geo-replication, provides the ability to replicate contents in one Data Center to another, and can extend the accessibility of that content across the globe. Using Windows Azure also boosts the scalability of an application. Another important feature of Windows Azure to consider is the cost-efficient benefit of hosting on the Cloud when an event such as a natural disaster or an extended power grid failure occurs. On a physical level, enterprise Cloud Data Centers are highly secured, typically with armed security, and have highly monitored access. One Microsoft Data Center facility investment is estimated to be over half a billion dollars and growing. From within these Data Centers, true Cloud computing was introduced to the world.

An example of a virtualized offering is running a VM (a software-based server that runs on a host computer), instance under VMware as a Cloud-based solution. Many in the industry are offering these types of hosted virtual solutions. In reality, this is a VM running in a data center where none of the previously mentioned features, including the essential security features, or capabilities, are typically

offered. Because of these differences, it is clear as to why a true Cloud offering could be the optimal choice.

Software that is truly Cloud-based has to be written for the platform. Simply claiming that a system offers a Cloud hosting option is not enough and takes more than just moving a server to a data center's virtual machine. A true enterprise Cloud software application has to dynamically interact with the Cloud platform resulting in dynamic resource allocation, scalability, reliability, error checking, and exception handling. All of this functionality cannot be offered by virtual machines.

Any software application that was quickly moved to the Cloud without being enhanced (or coded) to take advantage of the platform is likely being hosted in a virtual machine. These hosted applications are much more vulnerable than applications built to run on a true enterprise level Cloud platform. As a precaution, beware of vendor solutions *claiming* to run on the Cloud. Always verify these claims.

Some questions that can be asked to find out what vendors mean by saying their solutions are Cloud-cased are as follows:

- Is a virtual server is involved?
- What types of dynamic resource allocation are available? For example, if the solution needs more RAM, CPU, or storage is it instantly and automatically available?
- Will the resources used and *not used* be paid for? One of the biggest benefits of a true Cloud computing platform is the ability to pay for what is consumed and not pay for what isn't. This could result in cost savings to the consumer.
- Will a monthly statement on the resources consumed be provided? If not, chances are a virtual machine is the case. A monthly statement of resources used would indicate exactly what it is a consumer is paying for. Detailed consumption reports also provide for what the organization's technical requirements truly are.

Hosted solutions offer some excellent advantages, including no upfront hardware capital among other features; however, it should be thoroughly understood that true Cloud platforms offer the same and vastly more. A hosted virtual server solution and a Cloud solution simply do not compare and by no means are the same.

Breaking through the clouds and gaining a clear understanding of the new technologies available can result in a clear understanding of the next generation computing platform and software solutions. In the end, these technologies can provide unprecedented technological agility, as well as time and cost savings.