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So that's what they mean by \_\_\_\_\_:

Private Cloud! No Trespassing!

Banks shift to cloud computing and virtualization to improve availability and reliability and reduce costs

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There are more terms flying around bank technology these days than many executives can keep track of. Here are some explanations of four key terms.

#### Cloud Computing

According to Wikipedia, "Cloud computing is a style of computing in which dynamically scalable and often virtualized resources are provided as a service over the Internet. Users need not have knowledge of, expertise in, or control over the technology infrastructure in the "cloud" that supports them."

In other words, the cloud is another reference to the Internet, because it is typically represented by a cloud in network diagrams. Cloud computing runs on a system of interconnected computers configured to automatically balance load and use resources in order to realize the greatest processing capacity and resource efficiency possible. It may be used in public or private, closed-use settings, and be billed by either a license fee or usage fee.

#### ASP versus SaaS

Over the past few years, we have witnessed a significant shift in remote computing services, from an ASP (Application Service Provider) model to a SaaS (Software-as-a-Service) model. The difference between the two is not always apparent.

**ASP.** An ASP software provider houses its software at a remote data center, typically managed by a third party. The software or application is accessible by customers or end users through Internet communications methods such as the Web. The hardware running in the traditional ASP can be shared or may not be interconnected. In an ASP business model, the customer typically licenses the software or pays for the software on a monthly basis.

**SaaS.** SaaS, by comparison, is a general term referring to a service running in a remote environment and accessible by the Web. This allows "on-demand" user access, with activity billed according to usage. In a SaaS business model, the customer does not own the software, but is charged in a pay-as-you-go model.

Often, ASP costs are capitalized, while SaaS costs are expensed.

## Virtualization

An essential path to scale and a component of cloud computing is virtualization. With greater user accessibility to remote services, the ability to scale becomes critical in both ASP and SaaS models. Cloud computing offers a solution.

Virtualization is an abstraction of computer resources, through which the resources of a set of interconnected computers can be dynamically scalable or balanced without having to reconfigure particular applications or computers. With the recent maturity of hypervisor technology (also known as virtual machine manager), multiple operating systems are able to share a single hardware host, while the hypervisor controls and allocates resources as needed.

The net result is that the host of a virtualized service is extremely thin and consumes limited resources.

## Tying it all together

Today, there is a need for both virtualization and cloud computing within a private cloud. This means that the software is operated by a host for banks and their data are spread across multiple servers to most efficiently utilize hardware and infrastructure resources. Because it's private, the data is not open to the general public and is segregated one bank from another, ensuring a higher level of security.

After migrating ASP architecture to a private cloud, it's critical to leverage a mix of server virtualization; highly available database clusters; and related technologies to achieve a system that can dynamically failover\* and/or allocate resources based on system load.

Server virtualization is the masking of server resources, including the number and identity of individual physical servers, processors, and operating systems, from server applications and users. The server administrator uses a software application to divide one physical server into multiple isolated virtual environments. Said another way, virtualization is a method of running multiple independent virtual operating systems on a single physical computer. The virtual environments are sometimes called virtual private servers.

The benefits are: (1) a system that provides peak performance and reliability; and (2) greener processing due to lower energy consumption during lower-volume time periods. All of the servers that participate in the cloud environment are energy-smart to minimize the environmental footprint.

There are several reasons to adopt and implement virtual server architectures. In short, they make technology infrastructure better, cheaper, faster, easier, and greener. One practical benefit of virtualization is server consolidation. If, for example, the average enterprise server is 10-20% utilized, as studies indicate, virtualization can enable a 5-10:1 consolidation. The technology predicts to offer 60:1 virtual machines to a single server in the near future.

Fewer machines equal less rack space, less power consumption, less need for cooling, less maintenance costs and fewer components to break. This means easier data center management and a much greener footprint. IT management requirements and expenses are significantly reduced by running multiple applications and operating systems independently on single servers.

The results are: (1) replication of new server builds in minutes/hours instead of days/weeks; (2) improved control over OS (operating system) upgrades and configuration changes; (3) easier system administration; (4) improved application performance; and (5) easier disaster recovery and system backup capabilities.

Overall, this translates to more power and improvement in availability and reliability with less cost and more control over increased expenses related to growth and system usage.

\* Wikipedia defines "Failover" this way: "The capability to switch over automatically to a redundant or standby computer server, system, or network upon the failure or abnormal termination of the previously active application, server, system, or network. Failover happens without human intervention and generally without warning, unlike switchover."

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