The following is one of a collection of articles that addresses strategy around hybrid cloud architecture and IT as a Service.

While the hybrid cloud model is widely extolled in both the media and by industry manufacturers, many organizations find themselves challenged to effectively utilize both private and public cloud components. A successful hybrid cloud requires internal procurement and process changes that enable IT-as-a-Service along with a methodical approach to ensure adequate performance, reliability, security and compliance of off-premise workloads.

THE BIG PICTURE

Vendor keynotes and industry blog posts commonly extol the benefits of moving from an on-premise computing model to the cloud, whether internal or public. But while many corporations today have already virtualized their workloads, not many have deployed any significant number of them in a cloud computing environment.

Another name for cloud computing is IT-as-a-Service (ITaaS). Whether private or public, the cloud utilizes shared resource pools to automate and orchestrate the provisioning of virtual machines along with the required performance and security components. A chargeback system ensures that the IT provider, whether internal or external, has sufficient monies to support the environment while encouraging optimal resource utilization by users.

Applications should be carefully evaluated to determine which ones make good candidates for hosting by public cloud providers and which ones should remain on-premise. Economic, security and regulatory compliance are all important big-picture considerations, but tactical issues must be evaluated as well.

Websites are an omnipresent example of public cloud applications. But direct links to internal databases may make a website a poor candidate for off-premise hosting, at least initially. Publicly-hosted CRM packages such as Salesforce.com and Dynamics CRM have similarly been proven as excellent public cloud applications. But external hosting may not be appropriate when public cloud services utilize internal links to large data warehouses.

Even when it is determined that a large off-premise migration is the desired end-goal, organizations can still take “baby steps” and sample the public cloud without a complete commitment. This hybrid solution, whereby some workloads are maintained on-premises and some are maintained off-premises, is often a preferred approach. First migrate the easy servers and then gradually shift more workloads to the public cloud as warranted.

BUSINESS OBJECTIVES SHOULD DRIVE PRIVATE CLOUD REQUIREMENTS

IT manufacturers understandably tend to have myopic interests in promoting their own hardware/software solutions. When combined with a penchant for certain brand names or a desire
to leverage existing systems and tools, IT organizations often procure equipment and software based upon comfort levels rather than on open-minded analysis.

Deciding upon the appropriate products and platform for private cloud should not be driven by vendor promises but rather by the architectural requirements to enable the specific identified objectives. Business should drive IT—not the other way around.

Purchase decisions should reflect the ITaaS objectives of dynamic resource-pool provisioning. Computer, storage, network, load-balancing, backup, security, and disaster recovery solutions that worked OK in a physical or partially-virtualized environment may prove to be highly inefficient in an automated private cloud.

Architectural components should be selected based upon their ability to best support the private cloud platform. Blocks or pods are often an optimal approach due to the ability to easily add to the existing environment as increased capacity is required.

**THE KEY METRIC: VIRTUAL MACHINE PROVISIONING TIME**

Perhaps the most important metric for gauging the efficiency of the private cloud architecture is the length of time it takes to provision a virtual machine (VM). Manual VM process creation typically takes approximately five days by the time all approvals have occurred followed by the provisioning of the security, network and storage components. Strict compliancy and approval requirements may even take longer.

Newly-virtualized data centers tend to have plenty of capacity; running out of storage, CPUs or memory is not much of an issue. But eventually the increasing demand for VMs, combined with inefficient lifecycle management, results in a demand for additional resources. Provisioning times for a VM are often further delayed when its deployment triggers a requirement for additional resources such as a new SAN, network switch or server chassis.

A 2011 study sponsored by CA Technologies, The State of IT Automation, showed that 47 percent of the virtualized organizations queried reported taking a week or longer to provision a VM. Despite the overwhelming benefits of virtualization, departments frustrated by lengthy provisioning times of VMs may instead purchase their own pizza-box servers.

**AUTOMATED METERING CHARGEBACK FACILITATES IAAS**

A private cloud reduces the time to provision a virtual machine from days or weeks down to minutes. Choosing the appropriate equipment and tools, combined with cloud-friendly processes, is essential for success but constitutes only part of the solution.

Enabling ITaaS also requires implementation of a chargeback, or at least a showback process. A showback process provides an analysis of the IT costs due to each department without actually cross-charging those costs. The pressure on the departments to limit their usage is less direct, but awareness of the costs usually causes department heads and senior management to question why a department is “spending” more than another in IT.
Organizations in the earlier stages of the virtualization journey often fund requirements for new equipment out of the IT departmental budget. IT commonly stalls in fulfilling requests for new VMs by questioning each requestor about the need for a new VM and asking for approval confirmation.

As it becomes increasingly clear to all that lack of budget is the primary cause of the VM provisioning delay, IT organizations begin to implement a chargeback system. In some cases, this may involve simple guessing on the part of IT, which may make Solomon-like decisions such as how much should each department pay in the case of shared VM ownership.

More effective chargeback systems utilize automated metering policies based upon resource utilization—truly enabling infrastructure as a service (IaaS). Business units access a service catalogue that incorporates available server options along with automated approval workflows.

The server—along with the required network, storage, load-balancing, security and regulatory compliance components—is automatically provisioned and presented back to the requestor along with a monthly invoice for the resources utilized. A time limit for the servers is often utilized to prevent a dormant VM from continuing to consume resources. Requestors are forced to periodically renew their servers, or they are automatically de-provisioned.

The chargeback model enables efficient utilization of storage, computing and network resources that can be shared across multiple data centers. It also incorporates costs for services such as backups, redundancy and disaster recovery.

THE STRENGTHS AND WEAKNESSES OF PUBLIC CLOUD

IT organizations should not succumb to the hyperbole around whole-scale migration of workloads to the public cloud. Cloud deployments are not just an IT decision: they affect the entire business including customers, end users and investors.

While the automated server provisioning and chargeback services offered by public cloud providers may provide quick and easy access to new virtual machines, they can also create significant issues around compliance and security. These issues can be compounded when organizations continue to maintain a significant number of workloads on-premise. Passing corporate data back-and-forth between internal and external VMs increases risk of security compromise.

Public cloud access should not be ad-hoc. It should be incorporated as a carefully monitored aspect of an encompassing hybrid cloud model. Initially, only limited authorized workloads, such as development VMs, should be allowed off-premise. Eventually, the type of VM authorized to run with public cloud providers can be increased based upon acceptable economic, security and compliance criteria.

Development, also known as Platform-as-a-Service (PaaS), is an excellent starting point for utilizing public cloud services since developers often require servers to run the database and to test their programming. The developers may need to adjust the resources as well as test upgrades and fixes. Utilizing an off-premise solution thus takes an enormous load off the server administrators while making developers happy.

Microsoft’s Azure or VMware’s Cloud Foundry are examples of established PaaS providers allow
HYBRID CLOUD DEFINED
Hybrid cloud is a composition of two or more clouds (private, community or public) that remain unique entities but are bound together, offering the benefits of multiple deployment models. By utilizing hybrid cloud architecture, companies and individuals are able to obtain degrees of fault tolerance combined with locally immediate usability without dependency on internet connectivity. Hybrid cloud architecture requires both on-premises resources and off-site (remote) server-based cloud infrastructure. Hybrid cloud provides the flexibility of in house applications with the fault tolerance and scalability of cloud based services.

IT as a SERVICE DEFINED
(ITaaS) is an operational model where the IT organization of an enterprise is run much like business, acting and operating as an internal service provider. In this model, IT simplifies and encourages service consumption, provides improved financial transparency for IT services, and partners more closely with lines of business. This type of IT transformation is business focused rather than cost focused, leading directly to improved levels of business agility. Typically, ITaaS is enabled by technology models such as Infrastructure as a Service (IaaS) and Platform as a Service (PaaS), all of which are part of cloud computing.

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ROADMAP TO A HYBRID CLOUD
A roadmap for transitioning to ITaaS should incorporate both private cloud and public cloud components, but the process should begin with first identifying the business objectives desired. This provides the context for selecting the optimal IT architectures. Some organizations ignore public cloud alternatives while others jump quickly to a wholesale migration of off-premise hosting. Both options potentially incur the risk of competitive disadvantage. A hybrid model—with a careful, well-planned and methodical incorporation of public cloud—enables optimal computing resource consumption while ensuring performance, privacy and compliance.

ROADMAP TO A HYBRID CLOUD is one in a series of articles that create the conversation of “High Availability in a Hybrid World.” You can find all of the articles on our website at presidio.com/high-availability.php. These assets are meant as a resource for IT decision makers who are faced with the challenge of creating either a hybrid cloud or IT as a Service strategy.