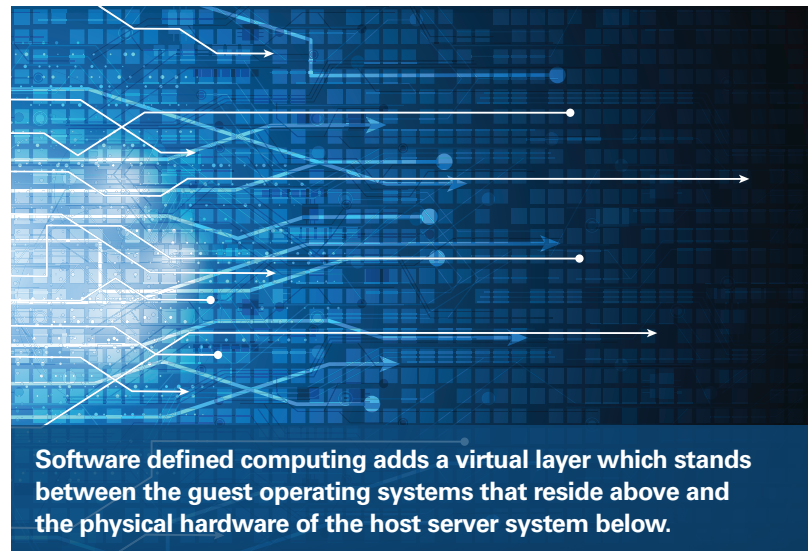# FIVE GAME-CHANGING ADVANTAGES OF SOFTWARE DEFINED COMPUTING

It was roughly a decade ago that the concept of server virtualization started taking hold in data centers across the country. Virtualization was introduced at a time when data centers were victimized by server sprawl on a grand scale as users clamored for new network applications, each one requiring its own server. Who knew back then that the notion of virtualizing servers would evolve into the blueprint of software defining the data center at large? What started out as a new approach to allocating server resources has now expanded into a new paradigm that is redefining the data center and how IT departments manage it. Server virtualization falls into the category of software defined compute (SDC) along with its counterpart, VDI or virtual desktop infrastructure. SDC challenged us to redefine what a "computer" really is, just as SDDC is now redefining our approach to the data center. SDC opened the door to a whole new world that liberated the data center from proprietary server hardware reliance and integrated a level of automation and elasticity that was hard to imagine just a decade ago. Below, we have outlined some of the value driven benefits of SDC.

1. SHARED RESOURCE POOLING

The greatest benefit of software defining any aspect of the data center is elasticity. This is clearly illustrated in SDC. When we utilize a traditional bare metal server, we are referring to a dedicated resource environment. The server is allocated physical built-in defined levels of memory, CPU and drive storage. Although this model which served data centers for many years has several inherent weaknesses.

Obviously the available resources for a bare metal server is limited to what is built-in to its design. Some resources such as memory can be physically upgraded (which requires extensive downtime) but many times an increased allocation in one resource type simply exposes the bottlenecks of another. For this reason, IT Managers habitually over-provision these purchases, buying for the forecasted usage demands of tomorrow rather than the reality of today. Even when servers are properly provisioned at the point of purchase, the majority of conventional servers operate at less than 15 percent of capacity.[1] What's more, these servers sit idle during downtimes, consuming resources that cost unnecessary money.

Software defined computing adds a virtual layer which stands between the guest operating systems that reside above and the physical hardware of the host server system below.

Server virtualization is built around the idea of utilizing resource pools. Software defined computing adds a virtual layer which stands between the guest operating systems that reside above and the physical hardware of the host server system below. This allows the virtual layer to create

logical pools of system resources so that multiple virtual machines can share the same physical resources. Resources are presented to the virtual machines as software, which can be manipulated at the click of a mouse.

2. SERVER CONSOLIDATION ANYWHERE

By maximizing compute resources such as memory and CPU, organizations can consolidate their server fleets and gain greater cost efficiencies. Host servers today can easily accommodate ten to twenty virtual machines so a hundred physical servers could be consolidated down to five to ten hosts. It is not uncommon to find organizations that practice even greater consolidation ratios than this however. Less bare metal means less rack space, power consumption and cooling demands.

A virtual server is essentially a file, and like any file, it can literally be stored anywhere. This could mean a virtual cluster of five vSphere hosts that can accommodate nearly all of the servers in your data center. It could mean a software developer that hosts a network test environment on their laptop using VMware Workstation. It could mean migrating all of your VMs to the cloud where users across the world can manage them through a management browser. Or it could mean hosting them in a highly flexible, highly automated software defined data center hosted on premise.

3. ACHIEVING YOUR TARGET OF THE 9'S

Achieving an availability rate of 99.999% is the lofty dream of most any IT Manager today. In the hardware dominated server infrastructure of yesterday's data center, this wasn't a dream, it was fantasy. The simple failure of a single NIC or memory stick would constitute taking a server down for service which assuming you had the part available on premise meant up to an hour of downtime. A more intricate situation involving a motherboard or a RAID card for a legacy server that was no longer supported by the vendor would translate into days of suspended outage.

Virtualization solutions such as VMware and Hyper-V make it easy to incorporate high availability and redundancy into your server infrastructure. By utilizing a clustered multi-host server farm and integrating tools such as vMotion and VMware High Availability, your virtual machines can instantly fail over in any instance of hardware failure or an anticipated one. This is because the VM's run independently from the hardware. Virtualization alone won't get you to the holy grail of the five 9's but the elasticity of SDC brings you a lot closer.

4. AUTOMATION

It isn't just about redundancy and high availability. It's about automation. It's about the software automatically migrating VMs to avoid an anticipated interruption in a totally seamless process with virtually no impact to users. It's about failing over VMs due to a host server going down and having all of the VMs migrated and operating without interruption before the network administrator is aware of the failure. It's about constantly analyzing performance and traffic loads and taking the necessary steps to achieve ideal load balance between the hosts and the allocated resource pools. It's about automatically provisioning additional resources when needed and decommissioning VMs in order to conserve power when the network isn't busy. It's all about letting the software run the constant operations so your IT staff can work on value generating ideas and projects.

5. PRIORITIZING

No two servers are the same in your datacenter. Let's face it, some servers are more important than others. Those mission critical application servers that users and customers depend on deserve greater priority than the others, which is why SDC allows you to do just that. You can guarantee minimum baseline resources for selected servers and prioritize an order of failover migration for all of your VMs. Today's data center cannot tolerate a one size fits all solution and SDC offers the granularity to manage each server in independent fashion.

These are just a few of the many advantages of SDC. Now imagine these same advantages assimilated throughout all facets of your data center. You can in a software defined data center. In a SDDC, your entire data center is just as elastic as your VMs.

TALK TO WEI TODAY

Our engineers have the knowledge and experience to help identify and implement the right solutions for your software defined data center. If your company has identified an initiative to transition to SDDC, let's talk.

Sources
1. http://www.vmware.com/software-defined-datacenter/compute#sthash.HpzoNg7z.dpuf

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