Virtualization Strategies for 2011

Time to Scale Out, not Scale Back

Contents

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Why Scale Out in 2011?

Experienced long-distance runners know that success requires proper pacing. They know when to settle in to their long stride and they know when and for how long to sprint. An incorrect decision, such as choosing a marathon pace for the final lap, leads to disappointing results.

In much the same way, successful business leaders know when to increase investment and when to hold cash — when to aggressively pursue new markets and when to focus on maintaining their current market position. What is true of investment strategy is also true of the data center: there is a time to scale back or hold steady and there is a time to scale out for future growth.

2011 might be a good time to scale out, or to increase capacity and optimize the IT organization's ability to deliver services to the business in a cost effective manner. As businesses worldwide — including your customers — look to grow, they may invest in new or upgraded products and services and may move forward with spending plans that were previously delayed. To profit from this growth, your data center must be agile enough to respond to unpredictable workloads so that your business can pursue new opportunities as they arise, and that means adding capacity.

When you do so, you will be in good company. Forrester predicts a 7.1 percent rise in IT spending in 2011 compared to 2010, projected to bring tech purchases to an impressive total of USD 1,690 billion.[1]

[1] *2010 to 2012 Global Tech Industry Outloook*, retrieved 1/15/2011.
Available http://www.forrester.com/rb/Research/2010_to_2012_global_tech_industry_outlook/q/id/58291/t/2

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SVMware recommends that virtual machines based on ESX/ESXi be assigned to their own physical core to avoid competition for core resources. VMware cautions, "If you bind a high priority virtual machine to CPU 0 and another high priority virtual machine to CPU 1, the two virtual machines have to share the same physical core. In this case, it can be impossible to meet the resource demands of these virtual machines."[2]

AMD Opteron™ processors feature up to 12 true cores so that you do not have to rely on hyperthreading and can minimize the risk of resource starvation when two logical processors compete for the same resources.

Make Virtualization Part of Your 2011 Strategy

Virtualization is one technology in which purchases can return fast, measurable results. If your organization has delayed virtualization projects, it might finally make sense to execute in 2011. Mature virtualization technologies make this a good time to scale out your data center as part of a virtualization strategy. On the software side of the IT stack, virtualization itself is ready for the data center. You can choose from a variety of hypervisors, vendors, management tools, and support offerings to craft virtualization solutions that make sense for your infrastructure.

On the hardware side, the latest enterprise-grade servers are optimized for virtualization, which helps organizations realize impressive savings and rapid return on investment (ROI). This optimization includes hardware-assisted virtualization — technology that offloads some virtualization overhead to the silicon and increases virtualization performance. In addition, the latest purpose-built servers feature multiple cores and threaded processing capabilities that make it possible to consolidate a larger number of workloads than the single-core or dual-core servers of five years ago allowed.

Many enterprises are using these workhorse servers to consolidate and virtualize a growing number of workloads, including mission-critical applications. Virtualization-aware, multicore servers are designed to handle demanding virtualization workloads and offer high consolidation potential that can serve even the most demanding data centers. When combined with mature virtualization software and management tools, these servers help data centers achieve remarkable agility. IT professionals can commission and decommission virtual machines on the fly in response to changing business conditions and, with plenty of capacity for consolidation, they can better utilize IT assets. Perhaps most important, an agile data center can deliver IT services to businesses faster and more efficiently than over-provisioned and underutilized data centers.

AMD: Your Data Center Partner for Cost-Effective Virtualization

If your organization is ready to move forward with its virtualization strategy, AMD is ready to help. Enterprise-grade servers based on AMD Opteron™ processors can help you maximize your virtualization strategy for less.

AMD Opteron processors deliver outstanding business value because they offer more processing cores than any other brand — up to 48 cores in a 4P configuration. These are true cores, not fewer physical cores divided into multiple logical processors. With more true cores available, IT professionals can dedicate a core to a high-priority virtual machine (VM) to help ensure maximum performance and availability. On the other hand, if flexibility and high utilization are priorities, IT administrators can free cores to be available whenever they are needed in response to business conditions. Servers based on AMD Opteron processors make both approaches possible, enabling outstanding VM performance while keeping the server infrastructure flexible.

In addition to multiple cores, AMD Opteron processors feature hardware-assisted virtualization, called AMD Virtualization™ (AMD-V™) technology, which helps to maximize VM performance by offloading some virtualization overhead to the silicon. With memory management and address resolution technologies that are handled on the silicon, AMD-V helps AMD processors deliver high consolidation ratios and VM performance that is at home in even the most demanding virtualized environments. It also provides for increased throughput and improved security with its embedded I/O virtualization technology, giving a VM direct access to an I/O device. This approach bypasses the hypervisor for I/O instructions and helps improve performance of I/O intensive workloads and also provides a hardware mechanism to secure VM memory against outside attacks.

Optimized for Virtualization: AMD Opteron 6100 Series Processors

Servers powered by AMD Opteron 6100 Series processors, the workhorse processors of the AMD Opteron family, deliver high performance and scalability in enterprise data centers. With two-socket and four-socket configurations and up to 12 cores per socket, AMD Opteron 6100 Series processors are designed for exceptional performance under load for both processor-intensive and multi-threaded applications.

These performance and scalability benefits are multiplied in virtualized environments because multiple VMs can be consolidated on a single powerful server with:[3]

- Up to 48 true cores
- Four memory channels

[2] See *"Hyperthreading and ESX/ESXi hosts."* Retrieved 1/22/2011. Available http://pubs.vmware.com/vsp40_e/resmgmt/wwhelp/wwhimpl/common/html/wwhelp.htm#href=c_hyperthreading_and_esx_esxi.html&single=true

[3] Measurements based on 4P server configurations.

- More than 100 GB per second of memory bandwidth
- 12 MB of shared L3 cache
- 12 DIMM slots per processor

Higher memory capacity allows virtualized servers to allocate more memory per VM to help ensure high performance or to host more VMs for consolidation of more workloads, which drives economies of scale into the data center. In addition, with multiple cores and large memory capacity on AMD Opteron™ 6100 Series processors, IT professionals can establish large resource pools of cores and memory — a flexible foundation for robust VMs that scale under load.

AMD Opteron processors deliver further value through the consistency of the AMD Opteron family architecture. For example, organizations that deploy servers based on AMD Opteron 4000 Series processors can easily scale out by deploying AMD Opteron 6000 Series-based servers because the two series share the same architecture, BIOS code base, and drivers. This consistency across platforms helps ensure easy management and flexibility and also provides investment protection through planned compatibility with future processor families.

Learn More Today

With increased spending on IT products and services, many organizations are ready to move forward with expansion plans. 2011 is a good year to scale out your data center because hardware and software are ready to support enterprise-scale virtualization and consolidation to help achieve business goals. With AMD Opteron processor-based servers, you can achieve high performance and flexibility with a larger number of consolidated workloads than ever before and drive the benefits of virtualization across your entire enterprise.

Learn more today at http://www.amd.com/opteron

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