

Powering Up Virtualization with HP ProLiant G7 Scale-up Servers



HP and AMD partnership offers new, high-performance, large-scale virtualization for an old-fashioned price

In a few short years, x86 server virtualization has gained universal recognition as an enabling technology for enterprises that want to increase efficiencies, lower operating costs and be infinitely agile. Many enterprise IT executives now realize that meeting the ever-intensifying demands of today's always-on businesses means nothing short of virtualizing every nook and cranny of the IT infrastructure.

As such, enterprises have been gradually moving virtualization from test-and-development starting points and into full production environments. On average, industry watchers believe enterprises have virtualized roughly 30 percent to 40 percent of their servers today.

But the pace is quickening, as enterprises now see virtualization as a crucial foundational technology for next-generation IT — i.e., cloud computing. Gartner numbers bear this out. At the end of 2009, the firm's research showed that 18 percent of enterprise data-center workloads that could be virtualized had been virtualized. By the close of 2012, that number is expected to grow to more than 50 percent, Gartner says.





With the rapid ramp-up of virtualized workloads comes the need for sophisticated server hardware, machines expressly developed with the next-generation data center in mind. Enterprises need physical servers that can handle these virtualization workloads efficiently and cost-effectively, while being highly scalable as well.

HP ProLiant G7 Scale-up Servers — The Value Add

HP offers best-in-class solutions in the new HP ProLiant G7 scale-up portfolio, its latest-generation four-processor servers and blades built from the ground up to address virtualization's unique requirements. Using AMD's newest and most powerful processors, for example, the HP ProLiant DL 585 G7 server and HP ProLiant BL685c G7 server blade G7 deliver the high performance and density needed for large-scale virtualization deployments, at a price historically associated with two-processor servers.

Extreme Processing Power

Introduced in November 2011, the new AMD Opteron™ 6200 Series processors offer the world's first 16-core x86 processors for high-volume 2P and 4P servers. From a server perspective, that means HP can offer up to 64 physical processing cores in its scale-up portfolio: the HP ProLiant DL585 G7 server and the HP ProLiant BL685c server blade at a 2P-comparable price.

With 64 physical processing cores, these scale-up servers — already capable of supporting up to a 23:1 consolidation ratio and yielding a 96 percent reduction in physical servers — can support unprecedented virtual machine (VM) density. Following the “one VM per core” rule of thumb, an HP ProLiant G7 server-based virtual data center can run with up to 64 VMs on a single server before running into resource constraints on that physical machine, says Stephanie Whalen, Worldwide 500 Series Product Marketing Manager at HP.

What's more, having 64 cores per server affords enterprise IT considerably more flexibility than they have when fewer cores are available, says John Fruehe, Director of Server and Embedded Product Marketing at AMD. For example, IT might allocate two or even four cores to one VM should that VM need to run significantly faster than others.

“Having a large number of resources to allocate, you can build what we call ‘robust VMs.’ These VMs get better performance and scalability than others because they have more resources available to them,” Fruehe says. “In simple terms, the bigger your pool of resources to distribute, the better each VM is going to be.”

Greater Memory Capacity

Besides the CPU boost, the AMD Opteron™ 6200 Series processors also enable a sizable increase in memory footprint, providing up to 1TB of fast,

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low-voltage DDR3 memory, Whalen says. In the HP ProLiant DL585 G7 server and HP ProLiant BL685c G7 server blade, the additional processing cores are matched with AMD’s next-generation Direct Connect Architecture 2.0, which provides four memory channels per CPU and HyperTransport 3.0 technology to deliver up to double the performance for virtualization (as well as other memory-intensive workloads). The HP ProLiant DL585 G7 server features 48 DIMM sockets while the HP ProLiant BL685c G7 server blades support 32 DIMM sockets for memory, each with a maximum capacity of 1TB, she says.

Improved memory usage is one aim of the AMD Virtualization (AMD-V) technology suite available with the AMD Opteron 6000 Series platforms, Fruehe says. In general, AMD-V enhances and accelerates software-based virtualization so that enterprises can run more VMs with less overhead. Particular to memory, AMD-V includes a technology called Rapid Virtualization Indexing (RVI), which allows a VM to have its own dedicated memory space.

“Any time there’s a translation layer in the middle, it’s going to slow things down. What RVI allows you to do is have the VM talk directly to memory, with its own reserved memory space, so it can do that back-and-forth communications without the need for translation. That speeds up everything rather dramatically,” Fruehe says.

Fruehe says he likes to associate the great amounts of processor and memory in servers such as the AMD Opteron™ 6200 Series processors-powered

the HP ProLiant G7 scale-up servers with a game of musical chairs. “When you’ve got more children than chairs, that’s like having more VMs than cores. When the music stops, somebody is left hanging,” he describes.

“That’s essentially what’s happening with virtualization. In round-robin fashion, the server lets each VM have a crack at the processors and memory. The more processor cores you have, the less the server has to be swapping out somebody else’s data and dropping in your data from your VM and so on,” Fruehe adds.

Richer, Less Complex Management

As much as many enterprises would like to push their virtualization deployments beyond the 40 percent or so mark, the inability to manage mixed physical and virtual server environments remains a strong inhibitor. In the HP ProLiant G7 scale-up servers, HP addresses the challenge with HP Insight Control, an integrated set of essential software for managing physical and virtual servers. HP Insight Control enables nearly every aspect of server administration and optimization, and allows organizations to deploy ProLiant servers quickly, proactively monitor server health and performance, optimize power confidently, and take complete remote control. In addition, HP Insight Control integrates seamlessly into enterprise management platforms from hypervisor vendors such as Microsoft and VMware.

Using HP Insight Control, organizations can significantly lower their operational

expenses — \$73,482 on average for every 100 users over a three-year period, according to research from the Framingham, Mass.-based analyst firm IDC.

The remote management capabilities available with HP Insight Control are particularly important to enterprise IT professionals looking to move more deeply into virtualization, Whalen says. Toward this end, the HP ProLiant G7 scale-up servers feature the latest and most powerful version of Integrated Lights-Out Advanced (iLO 3), the intelligent embedded management processor that comes with HP Insight Control. With enhancements available in the Advanced Edition of iLO 3, for example, administrators get an 800 percent faster remote console, 360 percent faster virtual media, direct access to the remote console and a dynamic Web 2.0 interface that provides updates in real time.

With help from iLO, administrators can perform maintenance tasks or collaboratively address hardware problems on HP servers from any remote location. Not only does this capability shrink system recovery times, but also reduces spending designated for on-site help.

Improved Networking Flexibility

In the virtualized data center, networking and, increasingly, convergence requirements join a technology tag team with server virtualization. HP considers the HP ProLiant DL585 G7 server and HP ProLiant BL685c server blade with their ability to increase efficiency, simplify

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operations and deliver automated intelligence in highly virtualized environments, a critical part of its Converged Infrastructure portfolio. A converged HP infrastructure brings together servers, storage, network devices and facility resources into a common environment so business can quickly adapt to change and reduce infrastructure costs.

The HP ProLiant DL585 G7 server, supports up to 11 PCIe 2.0 all full-length, full-height expansion slots for increased I/O and network bandwidth, Noce says. "Enterprises want low latency when virtualizing, and these servers can provide them with this functionality and much more."

In addition, the HP ProLiant DL585 G7 server offers a 10Gb Ethernet network interface card (NIC) upgrade option, which helps lower the costs associated with supporting network connections for virtualization host servers.

The HP ProLiant BL685c server blade supports HP Virtual Connect FlexFabric a hardware-based I/O virtualization tech-

nology that lets organizations partition a single high-performance 10Gb Ethernet connection into four virtual connections. With FlexFabric, enterprises can reduce infrastructure costs and complexity by converging LAN and storage traffic over the same flexible 10Gb Ethernet connection, says Andrew Hawthorn, HP Product Line Manager. With FlexFabric support, the BL685c G7 will be able to help enterprise IT sustain sufficient bandwidth for network-intensive applications, as well as optimize network and storage traffic with hardware acceleration and stateless TCP/IP offload, TCP Offload Engine, Fibre Channel over Ethernet and iSCSI protocols.

As enterprise IT professionals evaluate how they'll support rapid virtualization growth, they understand that the underlying hardware must meet four crucial criteria, Whalen says. These are: significant processing power, a vast memory footprint, many I/O slots and remote management capability. The new AMD Opteron™ 6200 Series-based HP ProLiant DL585 G7 server and the HP ProLiant BL685c G7 server blade do just that. In other words, they're ideal for virtualization.

Go Virtual on the G7 Servers

No doubt, as enterprises virtualize their production data centers to greater and greater extents, they're challenged by unforeseen demands on their existing server infrastructures. The new HP ProLiant G7 scale-up servers, with the new AMD Opteron™ 6200 Series processors, ameliorate the situation. With heavy-duty processor, memory capacities, and the latest in I/O technology, these servers provide up to 27 times more compute capability than previous-generation servers.

With the HP ProLiant G7 scale-up servers, enterprises can easily and economically grow their use of virtualization while easing management and optimizing infrastructure. And, they can create a future-proof environment.

The HP ProLiant G7 scale-up servers not only enable increased virtualization today, but also help customers in the enterprises prepare for the convergence of servers, storage and networking coming tomorrow. ■

