

 SearchSystemsChannel.com E-Guide

Chapter 2: Technologies

Blade server technologies are considered cost-effective and virtualization-friendly by server experts. Get a better understanding of blade servers and their scalable processing power in this chapter.



Chapter 2: Technologies

Table of Contents:

[Latest blade servers great fit for virtualization, analyst says](#)

[Blade server technologies for scalable processing power](#)

[IBM, HP tackle blade server FUD](#)

[Rackable shuns blade server fad](#)

[Server Specs: Egenera creates virtual blade server management software](#)

[Choices abound in blade servers](#)

[Server specs: HP announces storage blade server](#)

Latest blade servers great fit for virtualization, analyst says

Jan Stafford, SearchServerVirtualization.com

April 23, 2007

Sure, early blade server products ran too hot, cost too much and lacked configuration flexibility; but that's old news, says analyst Barb Goldworm. Today's new breed of blades may not be perfect, she says in this interview, but they run cool and are cost-effective when teamed with virtualization.

In this interview, Goldworm addresses the reasons why IT managers say they're not using blades, details advancements that have made blades better, and gives tips on using blades and virtualization together. Goldworm is president and chief analyst of Focus Consulting, a research, analyst and consulting firm focused on systems, software, and storage, and author of a new book, [Blades and Virtualization: Transforming Enterprise Computing While Cutting Costs](#), published by Wiley. She is chairperson of the [2007 Server Blade Summit: Blades and Virtualization](#), which runs from May 1-3 in Anaheim, Calif.

SearchServerVirtualization.com: Why do you think blade servers are a good platform for virtualization?

Barb Goldworm: Blades and virtualization address many of the same issues—consolidating to save space, reducing time to provision new servers, improving manageability, improving utilization of resources—so implementing them together as a hardware/software combination can provide double the benefits with a single implementation effort.

Now that blades are available with all the same options as rack servers (which wasn't true originally), virtualizing on blades gives the same configuration options, plus the additional benefits of blades. Examples of these additional benefits include modular components, shared components—power, cooling, management and networking—built-in remote, out-of-band management, pre-wiring, and of course, high density.

What did you hear from IT managers who are using blades when you were researching your book?

Goldworm: Those who had implemented virtualization on blades consistently told us that combining the two gave them much more for their money. One user, quoted in the book, advocated using deploying server virtualization on blades whenever possible. He said:

"The configuration becomes so much more manageable and redundant, and that boosts efficiency even more. Why? Because blades not only take up half the space of traditional 1U servers, but they also share vital resources such as switches and interface cards, allowing for more simplified, centralized management."

In our recent survey, the majority of IT managers responding said they have not bought and, in 2007, will not buy blade servers. Let's discuss their reasons for not buying blades, starting with the high cost of a blade chassis.

Goldworm: This [reason] is only valid for implementations with small numbers of servers. Although a blade chassis does mean an up-front investment in the chassis before paying for the individual blades, when you amortize the cost of the chassis and the shared components across all the blades, the cost per server is comparable or even less.

What's your view on another barrier respondents listed: the vendor lock-in that comes with a chassis?

Goldworm: There is a lock-in issue, in that blades from one vendor's chassis don't fit in another vendor's chassis. However, there is nothing to stop users from having chassis from more than one vendor. In fact, some users choose to do so to avoid having a sole source vendor issue, just as they do with rack servers.

In general, what we see is that users tend to standardize on one or two server vendors for most of their server needs. Then when they move to blades, they choose the blade vendors based on their preferred server vendors; e.g., if they've standardized on HP, IBM or Dell servers, they move to HP, IBM or Dell blades. It's also important to realize that all the blade chassis support multiple configurations of blades. You are not tied to populating an entire chassis with identical processors, identical memory, or identical storage configurations, thus creating a great deal of flexibility.

In our survey, a huge majority believe that blades' heat issue hasn't been resolved. In fact, a few keep their chassis half-loaded to reduce heat issues. Is overheating just an issue with servers built prior to 2007, or does it persist today?

Goldworm: In the earlier days of blades, cooling was a big issue, and many users ran half loaded. The past year has seen significant improvement in power and cooling efficiencies and management. In some data centers, cooling may be an issue; but, in many datacenters, there are lots of things that can be done to improve cooling and allow blades to be easily incorporated in the datacenter. In addition, chip, blade and power/cooling vendors are still working on this issue, with improvements continuing to come.

Is there still a problem with blades' lack of flexibility in peripherals?

Goldworm: There's probably some confusion here as well. In early blade systems, there were several areas of limited flexibility with I/O. First, the embedded switches in the chassis were limited to certain vendors and certain features from those vendors. Now the switch options have expanded both in the vendors supported and in the features available on the switches. In addition, if you don't want to use embedded switches, you can always use the pass-through options to connect to external switches, just like you would with rack servers.

The other area that caused concern early on—and still does for those relying on old information—is the myth that blades only allow 2 NICs per blade, which would be particularly problematic for virtualizing on blades. Fortunately, this limit is no longer valid, and most blades now go up to 6 or 8 NICs per blade (depending on the vendor).

Blade server technologies for scalable processing power

For those less-frequent applications requiring specific non-standard cards, there are some that are not available in a blade form factor. Those applications would not run on most blades, however, there are some blade vendors (e.g. Sun, Hitachi) who support standard PCI-express cards as add-ins to their blade chassis.

How do blades stand up to racks in ease of management?

Goldworm: Blades offer significant improvements in ease of management due to their architecture. Blades were designed from the outset for remote lights-out management. Even if the OS is down, you still have remote management capabilities to every component in the chassis, without doing any special wiring (it's all pre-wired). The chassis includes redundant management modules which are automatically connected to everything. In addition, if there is a failure, even a non-technical person can read the lights, pop out a failed blade and pop a new blade in.

Initial deployment is simplified by the pre-wiring, and ongoing cable management is far easier for the same reason. Blade chassis wiring always looks like the person who does the wiring is extremely fastidious.

In addition, some of the new virtual I/O capabilities offered in blades this year add to the ongoing management benefits by simplifying configuration changes. For example, HP's Virtual Connect for the HP BladeSystem abstracts the physical I/O connections from the components within the network allowing changes to be made within the chassis without having to reconfigure everything outside the chassis.

From your answers, it seems that many objections to using blades are based on users' negative experiences with first-generation blades.

Goldworm: Yes. Since many of the concerns I hear from folks are based on old data, I encourage people to get the most up-to-date information they can before making their next round of strategic decisions. While neither blades nor virtualization are right for every IT shop or every application, they both offer significant advantages in both real dollars and ongoing soft costs.

Blade server technologies for scalable processing power

Mark Arnold, Contributor

April 15, 2007

Processing power demands continue to increase with no sign of abatement. Customers want Web sites available 24/7, users want email permanently available, and they're impatient when those requirements aren't met. Server rooms and data centers must host ever more hardware to meet on-demand society needs—and [blade server](#) technology is coming into play.

Sometimes these requirements are temporary or transient in nature; a project might require a suite of servers for a fixed period of time. Procuring new hardware, configuring it, supporting it during the project's

timeframe and decommissioning it at the end can create significant businesses problems involving capital expenditure, data center access and change control.

One useful way to circumvent this problem is to use blade servers. A shelf of blade servers will use power more efficiently than similar numbers of physical "pizza box" (1U) servers, utilize fewer network ports and require less rack space.

[Blade servers combined with virtualization technologies](#)—such as [VMware Infrastructure](#) using ESX Server and System Center—scale out the number of server instances that can be run on a pair of processors, and scale up server power by being able to use a single processor at first and add processors as business volume increases. There is nothing worse than seeing a server sit idle because the anticipated level of business didn't materialize—except seeing servers collapse under the sheer number of users because the service was greater than anticipated.

But blade server technologies don't need virtualization to leverage potential efficiencies. On their own they are every bit as useful and scalable. Blade servers borrows their operating system design from the [storage area network \(SAN\)](#), inevitably found in every data center. Taking disks out of blades reduces power requirements a little more and makes the blade a commodity item. Should a blade fail, ownership of the LUN on which the operating system resides is simply switched, automatically or manually, to a spare blade. If you wanted to maintain a spare 1U traditional server in a rack with traditional storage, you would have to enter the server room, power down the server, remove local disks and power up the spare server.

However you look at it, blades provide scalable computing power rapidly, so you can deploy new servers to your customers within minutes rather than hours or days.

IBM, HP tackle blade server FUD

Alex Barrett, News Director, SearchServerVirtualization.com
January 31, 2007

Today's blade servers are by no means constrained in their I/O capabilities, said executives from industry leaders IBM and Hewlett-Packard, and make an excellent virtualization platform.

Responding to [criticism of blades' limited I/O capacity](#) for virtualization environments like VMware, Richard Fichera, HP director for blade systems strategies, pointed out that unlike previous generations of blade servers, HP's latest c-Class BladeSystem chassis can be configured with up to eight network interface cards (NICs) per blade.

Blades have undergone a progression, Fichera said, from their earliest days, when manufacturers focused on "the most numbers of small, dense blades," to a second generation "that was the equivalent of rack-mount servers," and finally, to today's third generation systems, which feature "massively scalable I/O both inside and outside."

The imminent availability of 10 Gigabit Ethernet (10GbE) connectivity should put to rest any lingering concerns. IBM announced [10GbE for the BladeCenter H](#) in mid-January in the form of a Nortel 10G switch module and NetXen 10GbE Ethernet expansion cards.

With up to two dedicated 10GbE expansion cards per blade in the chassis, Ishan Sehgal, IBM program director for the IBM BladeCenter, said the system offers “ample I/O” to the virtualization hosts.

Hewlett-Packard has yet to announce 10GbE for its BladeSystem, but such a system should start shipping at roughly the same time as IBM’s, HP’s Fichera said.

Whatever the case, I/O—or lack thereof—certainly hasn’t limited some shops from going all out with virtualization on their blade servers. Tom Petry, director of technology for the District School Board of Collier County, Florida, has a total of 508 HP BL35p blades in 32 p-Class BladeSystem chasses, all of which are running VMware ESX, for approximately 1500 virtual machines (VMs). About 500 of the VMs are servers, and the rest, while the rest serve up a traditional Windows XP desktops to Hewlett Packard thin clients.

Even with simple Gigabit Ethernet NICs on the blades, lack of network bandwidth hasn’t been a concern for Petry. “Obviously it’s going to depend on your network traffic,” he said, but so far, the available bandwidth has been more than enough to handle the traffic generated by his VMs.

Meanwhile, resellers report being able to sell large blade system configurations for less than comparable rackmount servers. “I just did a quote today,” said Adrian Clint, blade solutions architect with SCC, an HP reseller based in the United Kingdom, in which he was offered a 16-server BladeSystem c-Class for 15% less than 16 comparable rackmount servers.

Clint attributed the cost savings to the high levels of redundancy built in to the chassis, and shared infrastructure. For example, in the above quote, the management ports get consolidated down to two, down from 16; you need far fewer cables, transceivers, and even power supplies.

Still, users have plenty of concerns about blades, Clint said, but they tend to worry more about issues of power consumption and price than network bandwidth.

“Truth be told, so far nobody’s asked me to fill a blade with the maximum number of NICs,” Clint said.

Rackable shuns blade server fad

Bridget Botelho, News Writer, SearchDataCenter.com
February 28, 2007

Blade servers continue to be a high-growth segment with blade shipments 33% higher in 2006 than the previous year, Gartner reported last week. But not all vendors are hopping on the blade bandwagon.

While Hewlett Packard Co. (HP) screams “blade everything,” Rackable Systems, a relatively small, California-based provider of server and storage products, focused on scale-out data centers, has no plans to offer blades.

“Large-scale data centers already see results similar to blades from us. We offer hybrid servers similar to the competition’s blades, but with scale-out server features,” said Colette LaForce, vice president of marketing, Rackable.

The company sees no need to offer blade servers because its x86 servers already offer much better density than traditional rack-mounted systems. At 15 1/2- inches deep, they are about half the depth of most servers, allowing up to 88 servers in a single cabinet—compared with 42 traditional servers.

That compares favorably with blade servers. According to IBM, 84 dual-processor servers fit in the space of a traditional rack.

Rackable’s products also tackle other data center issues, like thermal efficiency, with servers that don’t have internal power supplies.

Rackable’s proprietary system uses DC power rather than the typical AC power, and the rectifiers that convert the incoming AC power to DC power are external. Without internal power supplies, Rackable servers generate less heat than conventional servers, the company claims, and the rectifiers can be located away from the server racks to be closer to cooling sources.

Rackable, a long-time business partner of Advanced Micro Devices Inc. (AMD), also announced last week that it would offer the newest AMD Opteron processors, models 2220 and 8220. The processors have AMD’s native dual-core technology and support DDR2 memory. Rackable will also offer AMD’s upcoming quad-core processors when they become available.

“The core reason a data center comes to us is for density,” LaForce said. “We are very particular about what we pack into our systems so that we deploy the most efficient servers that save on power and cooling.”

Rackable claims pricing for its systems is competitive with companies like HP, IBM and Dell Inc., but LaForce played down the purchase price angle. “We find that data centers are more interested in operational expenses and not so much the cost of the hardware itself. It doesn’t really matter if you’ve only spent a certain amount on a server. It is a waste if it is pumping out a ton of heat and is costing you extra money for cooling,” he said.

Sticking to what it knows seems to be working for Rackable. Still a small player compared to IBM, Dell and HP, Rackable had the highest growth among the top 10 vendors that ship servers worldwide, with a 68% increase in 2006, according to a Gartner report release Feb. 22.

The only other vendor in the top 10 to increase its shipment share was NEC. In server shipments, HP remained the worldwide leader for 2006, growing 8%.

Server Specs: Egenera creates virtual blade server management software

"You do hear their name quite a bit," said Gordon Haff, an analyst with Illuminata Inc.. "They're one of the smaller x86 server companies that has managed to break out from the pack."

Server Specs: Egenera creates virtual blade server management software

Mark Fontecchio, News Writer, SearchDataCenter.com
November 14, 2006

Egenera launches virtual blade server management software

Egenera has created an add-on to its blade server management software allowing deployment of virtual machines onto any of its blade servers at any time.

The Marlboro, Mass.-based company said the software, called vBlade, will be integrated into its PAN Manager software. Egenera's PAN Manager, short for Processor Area Network Manager, was [updated](#) earlier this year. But previously, users could only deploy one server image onto one physical server at a time. With vBlade, a user can deploy multiple virtual machines onto a physical server at any time, with all applications streaming across a network and not sitting on the physical hardware.

The foundation of Egenera's hardware and software is using [blade servers](#) as commodities with just processors and memory. Applications are streamed across the network to the blade when needed. In this way, IT shops can customize their blades to work for applications, rather than being cornered into having a particular server provide a particular function.

"You can have a virtual or full blade running Linux and could literally repurpose that in two minutes to become a Windows Exchange Server," said company vice president Susan Davis . "It's simply a configuration that's applied when it's asked to."

PAN Manager and vBlade works only on Egenera blade servers running Red Hat, Novell, Windows or Solaris 10. Egenera customers can preview the vBlade software now, but it won't be available for general purchase until the first half of next year. Pricing was unavailable.

HP releases servers with quad-core chips

Hewlett-Packard Co. (HP) released nine tower, rack and blade servers today that use the new quad-core Intel Inc. Xeon processor.

The models include ProLiant ML150 G3, ML350 G5, ML370 G5, DL140 G3, DL360 G5 and DL380 G5, and the BladeSystem BL20p G4, BL460c and BL480c. [Dell Inc.](#) and IBM have also released servers using Intel's

new chip. HP said that its new servers can improve performance up to 48%. Prices start from about \$2,000 to \$3,700, depending on the model.

The Intel Xeon 5300 processor, nicknamed Clovertown, consists of two dual-core server chips tied together by a frontside bus on a multichip module. Advanced Micro Devices Inc. (AMD) claims that is not a native quad-core, which it said would be four cores on a single die and what it plans on releasing next year. Intel also plans on releasing a new "native" quad core next year, so the race continues.

HP has also released a 2U rack server, the DL320s, that has extra storage and is designed for "media-rich" computing environments, according to the company. The server has Intel Xeon 3000 dual-core processors with 8 GB of RAM and up to 9 terabytes (TB) of storage.

Sun adds HPC server to blade platform

Sun Microsystems Inc. today announced a blade server and chassis designed for high-performance computing (HPC).

Sun [unveiled its blade platform](#) in July, dubbing it the 8000 Modular System. The new HPC blade fits into a specialized chassis that is 14U, or 5U less than the original blade server chassis. The space reduction was made possible by taking out I/O cards, trading off network connection options for more computing density. As a result, Sun said a single rack can support 240 CPU cores and provide for 1.2 teraflops. The company announced support services for Sun HPC customers to go with it.

Sun also announced that 20 software companies are working to host applications on Sun Grid in the hope that the [utility computing](#) service will expand. Much of the criticism of Sun Grid is around the applications, or lack thereof, hosted on the service.

Choices abound in blade servers

IT Business Edge
September 20, 2006

IT Channel takeaway: Blade servers continue to get regular press, but how do they stack up? Find out how blades can possibly be a benefit to your company. **With Charles King, principal analyst, Pund-IT, Inc.**

Question: Blade servers seem to be getting a lot of attention lately, due mostly to their ability to scale up quickly and easily. But aren't there still many environments in which a traditional rack-mount, or even a tower, would suffice, and at a better price point?

Server specs: HP announces storage blade server

King: Sure. Blade servers are really aimed at businesses that need to squeeze maximum performance and flexibility into as small a space as possible, so they provide superb solutions for server/data center/application consolidation efforts. The ability to swap out or install new blades on the fly makes them a good choice for companies that plan or expect to regularly grow their server environments. For many companies, particularly SMBs, work groups, and remote office environments, rack or tower servers often provide a great mix of price/performance. But the blade market is changing so swiftly that it's wise to keep an eye on new offerings, in case something comes along that can significantly improve business performance or support entirely new kinds of applications.

Question: Sun pulled out of the blade market last year because it didn't have confidence in its product. How do the company's new products stack up against HP's and IBM's lines?

King: Hard to say, since the details have mostly been sketchy with an emphasis on enhanced I/O performance. I expect Sun's new blades to leverage what Sun has learned (and profited from) in its Opteron-based servers, and to emphasize the company's reputation for engineering innovation. That should speak well to Sun's existing customers, but it's hard to say how others will respond. Historically, the company has had a hard time sustaining efforts beyond UltraSPARC/Solaris.

Question: Cooling and power consumption continue to see a lot of activity. Should IT executives invest in blades now, or wait to see if even greater gains can be had later?

King: That's an issue with a two-sided response: Over time, blades (and other server architectures) will almost certainly become more powerful and efficient, and power costs will almost certainly increase. However, timing IT purchases to obtain maximum value is difficult, at best. To be successful, IT purchases need to be the result of larger strategic efforts aimed at providing maximum support for critical processes or emerging opportunities. Cooling and power consumption issues are merely two elements to consider in the larger scheme of things.

Server specs: HP announces storage blade server

SearchDataCenter.com, Staff

November 2, 2006

HP releases storage blade server

Hewlett-Packard Co. (HP) has announced an industry first: a storage blade that slides right into one of the slots in its BladeSystem [c-Class chassis](#), providing additional capacity to storage-hungry server blades.

But you probably won't find too many of the new StorageWorks SB40c blades in the data center. According to Steve Gillaspay, general manager for HP BladeSystem, the target customer for the SB40c is "small-to-medium business with no SAN," or perhaps "a retail store, where [customers] want all their servers and storage in one enclosure."

Server specs: HP announces storage blade server

"This is direct-attached storage [DAS]," Gillaspay said. "It's like an external JBOD like the [StorageWorks] MSA30 or MSA50," he added, except that it uses the power and cooling supplied by the c-Class enclosure.

Specifically, the SB40c supplies up to six 2.5-inch serial attached SCSI (SAS), serial ATA (SATA) or SCSI disk drives. Assuming 146 GB drives, it can deliver 876 GB of additional capacity.

That capacity can only be used by a single server blade in the chassis, Gillaspay said. In fact, the storage blade must be adjacent to the server blade to which you want to add capacity, as it uses the enclosure's PCI bus for connectivity.

"It's definitely not for everyone," Gillaspay said. Applications that might benefit from a storage blade include small databases, file and print, messaging or video streaming, he said.

Primitive as the initial storage blade may be, it's only a first step. In "the 2007 timeframe" HP will deliver a storage blade that can be shared by all the servers in the chassis, Gillaspay promised.

The SB40c will be available in mid-November, with a list price of \$1,599 for the blade alone. A 146 GB SAS drive costs an additional \$439.

Sun adds to 'try and buy' program

Sun Microsystems Inc. has added one of its newest rack servers, the Sun Fire x4600, to a [60-day free trial program](#) and plans to do the same soon with the x4500, its storage server that was code-named "Thumper."

The x4600, [released in July](#), is a 4U rack server that can hold up to eight dual-core Advanced Micro Devices Inc. (AMD) Opteron processors, double the power of its earlier model, the x4200. The x4600 starts at about \$26,000. Other servers in the "try and buy" program include a range of Sun Fire servers, such as the Opteron-based x2100, x4100, x4200 and the UltraSPARC T1-based T1000 and T2000.

Under the program, potential customers get a free 60-day trial with Sun shipping the desired servers at no charge to end users. Users have to agree to Sun's terms and conditions when signing up at the company's ["try and buy" Web site](#).

HP names new Itanium leader

HP has named Martin Fink, the previous leader of HP's NonStop servers, to head the Itanium server division.

The NonStop division, which sells HP's highest end servers along with its open source and Linux divisions, has become part of a combined group. Fink is the leader of the expanded group, replacing former group chief Rich Marcello, who is retiring.

HP decided to bring its open source and Linux divisions into the new group because much of the work done with open source and Linux in HP is done for higher end servers, such as the Itanium-based NonStop systems.

Verari has new blade storage system

Blade server manufacturer Verari Systems Inc. introduced a blade-based storage system at the Storage

The VB5150 is the San Diego company's newest option for network attached storage (NAS) on blade servers. It includes potential for up to 30 terabytes (TB) of storage for every system. The system includes a head node and four disk blades that have dual-core Intel Xeon processors.

Verari's customers include Lockheed Martin Corp., Qualcomm Inc. and Sony Pictures Imageworks.