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WHITE PAPER

Enabling Business Agility Through Server Blade Technology

Sponsored by: Hewlett-Packard

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IN THIS WHITE PAPER

This white paper provides an in-depth review of the emerging market for Intel-based blade computing, including IDC's latest forecast for blade market penetration, which reflects our outlook on the transition of the customer datacenter to one based on modular server technology. This document highlights Hewlett-Packard's (HP's) role in enabling a blade ecosystem that includes:

- Several hardware products
- A host of management tools designed to address acquisition costs, installation/planning, deployment/system provisioning, maintenance, and upgrades
- A robust partnership program designed to provide best-of-breed solutions for infrastructure and enterprise computing environments

SITUATION OVERVIEW

Today's datacenter is evolving in response to the need for technology to support the nearly constantly changing customer business environment. Yesterday's datacenters were largely built on relatively inflexible platforms that required expensive and often scarce IT management skills. This has led to a situation where, by IDC estimates, approximately 60–70% of historic server life-cycle costs are associated with ongoing operational expenses. What this trend means is that customers will continue to demand — and vendors will need to continue to develop — technology that is not only inexpensive and reliable but also simple to implement, use, scale, and (most important) integrate into existing environments. As datacenters build out their infrastructure to meet the needs of a connected world, the increasing demand for infrastructure integration, ease of deployment, and flexible management will force technology vendors to research and develop simple-to-implement "building blocks" that can be assembled to deliver complex solutions. The keys to this ongoing evolutionary phenomenon will be the development of a broad set of complementary hardware and software products and a multitude of industry partnerships that can all come together to provide compelling customer value.

Moving forward, HP, along with the IT industry in general, is pushing into a new environment in which business services, built around hardware platforms, software, and services, are designed for more dynamic delivery and with a maximum of IT automation to address the demand for lower costs and higher levels of business agility. HP is delivering these efficiency technologies under the Adaptive Infrastructure program — a broad initiative that encompasses the monitoring, management, automation, and virtualization of datacenter resources.

INTRODUCTION

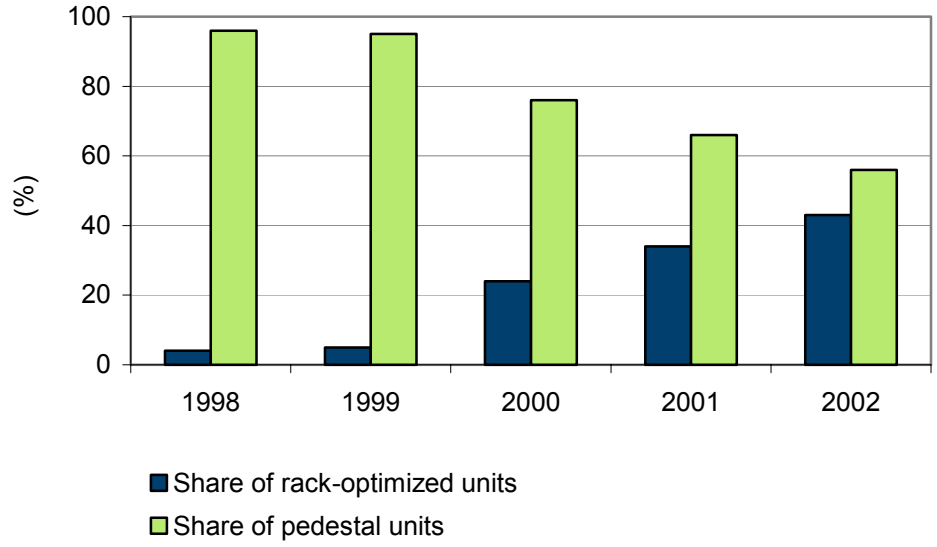
The past few years have witnessed an increasingly tighter coupling of business process and information technology. For businesses to compete, the appropriate IT infrastructure must be in place. As long as any changes are steady and predictable, the scaling of business and IT is predictable. However, once growth becomes erratic, or changes in business directions become unforeseeable, IT infrastructures rapidly run the risk of becoming ineffective. This "variability" (e.g., economy, globalization, mergers/acquisitions, or corporate restructuring) has been the norm for the past few years; as a result, the technology industry has made adjustments to bring IT capabilities into alignment with current business needs.

Specifically, users are increasingly demanding more virtual and dynamic computing environments that simplify the complexity associated with managing multiple, geographically dispersed datacenters, maximizing management automation, and addressing the datacenter floor space constraints and cabling issues associated with distributed computing environments. The server blade is rapidly becoming the platform of choice in addressing these operational challenges.

Driven by customers who demand that information systems be scalable, available, and efficiently managed, the design of servers has continued to evolve. Recently, with the move to consolidated datacenters, standalone "pedestal" servers with attached storage have been giving way to rack-optimized servers attached to network storage to increase server density and better utilize valuable floor space (see Figure 1).

FIGURE 1

ENTRY SERVER SHARE BY SERVER FORM FACTOR, 1998–2002



Source: IDC, 2003

Blade architecture represents the next step in this server evolution: a shift to servers packaged as single boards and designed to be housed in a chassis that provides access to all shared components.

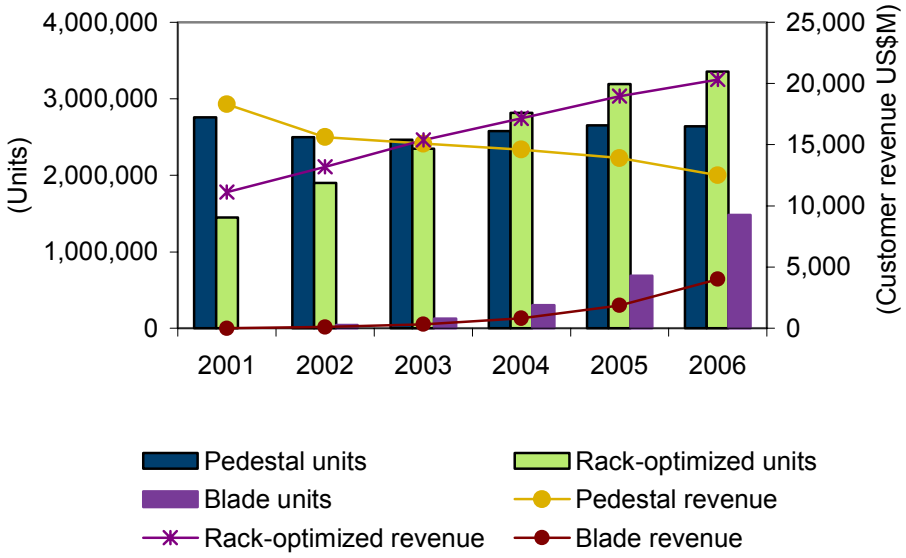
THE SERVER BLADE CONCEPT

IDC defines a server blade as "an inclusive computing system that includes processors and memory on a single board." Most notably, power, network access, and storage services are not contained on the server blade. These necessary resources, which can be shared among a collection of blades, are accessed through the backplane of the chassis — that is, the power and network interconnect bus connections are a part of the cabinet that houses a collection of the blades. Blades are easily installed and removed, and they are smaller than rack-optimized servers. Blades may be general-purpose servers, or they may be tailored to and preconfigured for specific datacenter needs (e.g., as security blades with firewall, virtual private network [VPN], and intrusion detection software preinstalled).

IDC believes that server architectures are becoming increasingly modular, and that market share for blade servers will grow to 20% of server units shipped in 2006. As Figure 2 shows, blade architecture is on its way to being a major market segment. Pedestal servers, once the only form factor in the market, will retreat from their dominant market share position in 2001 to a modest 36% share in 2006. Recent rapid growth in the rack-optimized server segment will peak in 2004, then decline slightly, as blade architectures compete successfully against rack-optimized alternatives.

FIGURE 2

OUTLOOK FOR MODULAR COMPUTING — ENTRY SERVER OUTLOOK BY FORM FACTOR, 2001–2006



Source: IDC Quarterly Server Forecaster, 3Q02

With blades expected to capture 20% of the market by 2006, it is becoming apparent that the form factor for server blades will not look the same. Increasingly, both early customers and server manufacturers are recognizing that there is a need for a variety of blade products. A portfolio of blade products (like those in the rack-optimized and pedestal server markets) is necessary to handle the broad spectrum of computing requirements — from front-office terminal serving and Web farms to back-office applications and as nodes in clusters for explicitly parallel computing applications targeted at the technical and financial verticals — because each requires the right tool for its specific job. The HP ProLiant BL server line can support this diversity, with front-end, mid-tier, and back-end server blades.

Recognizing the demand for a variety of blade offerings, vendors will need to provide a portfolio of products that meet a large spectrum of computing needs for blades to gain broad end-user support. This focus on diversifying blade portfolios has been spotlighted recently, as manufacturers have come forward with a variety of products — each designed for particular tasks in the datacenter. However, with the introduction of the ProLiant BL e-Class and the BL p-Class (including second-generation BL20p and now the BL40p quad processor blades), HP has moved forward with the largest blade portfolio currently available in the market.

The range of HP's portfolio translates into broader applicability for blade computing and illustrates the depth of HP's commitment to the modular computing paradigm. In the approximately 18 months since entering the market, HP has signaled the strength of its convictions through a steady flow of product introductions and updates that have extended its modular opportunity. Table 1 illustrates HP's BL-line product specifications and some example workloads appropriate for each product.

TABLE 1

HP BLADE SERVER PRODUCT PORTFOLIO

Product	Product Specifications	Example Workloads
BL10e	Up to 20 server blades/3U enclosure	Static Web server
	One Intel ULV PIII 900MHz processor/blade	Infrastructure applications
	Max of 1GB memory (512MB standard)	Computational cluster node
	40GB storage per blade	
BL20p G2	Up to eight server blades/6U enclosure	Dynamic Web/ASP hosting
	Up to two Intel Xeon processors DP 3.06GHz processors/blade	Computational cluster node
	Max of 8GB DDR memory per blade	Terminal server farm
	Max storage of 292GB per blade	AV, media streaming
	Heterogeneous Fibre SAN support	
BL40p	Up to two server blades/6U enclosure	Database server
	Up to four Intel Xeon processors MP 2.0GHz processors/blade	Mail/messaging server
	Max of 12GB DDR memory per blade, with online spare	HA failover cluster
	Max of 584GB internal storage	
	BL p-Class enclosure supports both 20p and 40p servers	
	Heterogeneous Fibre SAN support	

Source: IDC, 2003

Table 1 also shows that the current HP blade products are designed to be complementary: The e-Class is suited for front-end workloads; the dual-processor BL20p G2 is oriented toward more demanding workloads, enterprise applications, and large clustered environments; and the BL40p is appropriate for application and distributed database computing environments. Both the BL20p G2 and BL40p attach to the SAN for broad storage services support.

IDC sees these products from HP as the beginning of a rich blade ecosystem within the marketplace that ultimately directs the industry toward an increasingly modular environment as the foundation onto which life-cycle services — from the design and planning, to the building of a blade architecture, to the ongoing management and evolution of the business applications — can be layered to provide enhanced customer value. To this end, HP ProLiant blade products combine to encompass the many current and rapidly emerging needs and opportunities of modular computing.

THE BLADE ECOSYSTEM

Extending from this portfolio of blade products is HP's Blade Server Alliance program. This program has become a rallying point for independent software vendors, offering customers a multitude of choices — from operating systems to applications and systems management. The goal of the program is to quickly build and enable a diverse set of solutions for bladed environments. This approach enables HP to ensure and accelerate the delivery of cost-effective, compatible, and widely available blade server architectures to a variety of verticals and market segments. The program also provides customers with a consolidated list of precertified solutions that are compatible with HP's ProLiant blade systems, reducing the risk associated with migrating to a new hardware platform.

The start of the program and the introduction of HP's first blade server were nearly simultaneous events; hence, it has had time to develop a variety of partners across the entire software ecosystem — from operating system to system management through the application layer. Examples of partners in this area are included in Table 2. (This list is not intended to be an exhaustive list of products and applications supported on blade platforms. A more comprehensive list of HP's blade partners can be found on HP's Web site.)

TABLE 2

HP BLADE SERVER ALLIANCE PROGRAM SOLUTIONS

Operating Systems	Infrastructure Applications	Enterprise Applications
Microsoft	F5 Networks — load balancing	SAP
Red Hat	F5 Networks — traffic management	Oracle applications and decision support systems
SuSE	Check Point — firewall and VPN	Siebel
United Linux	V-One — firewall and VPN	PeopleSoft
	Blackberry — mobile gateway	JD Edwards
	InfoWave — mobile gateway	Microsoft Exchange (OWA)
	Microsoft MIS — mobile gateway	Microsoft Commerce 2000
	Microsoft IIS — Web server	Commerce One
	Apache — Web server	BroadVision
	Covalent — Web server	Citrix
		Sendmail

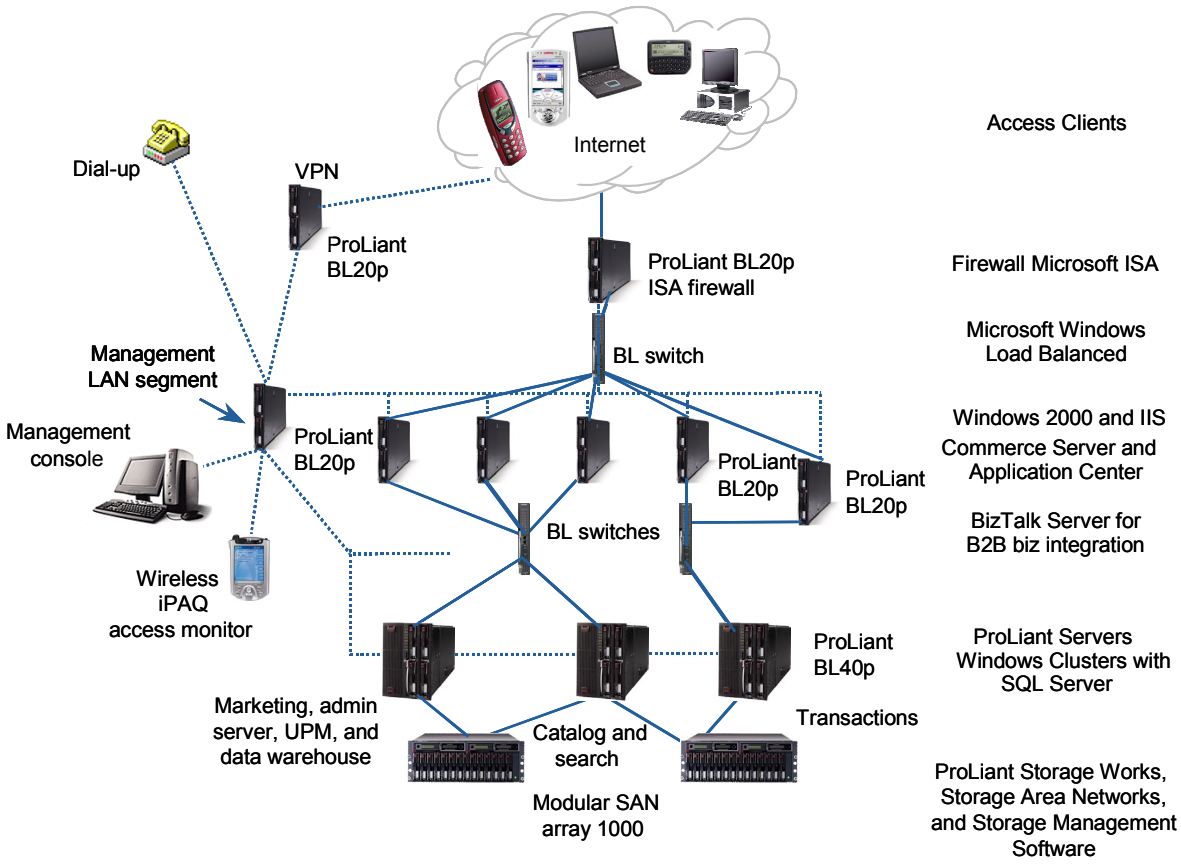
Source: IDC, 2003

With the introduction of the new BL40p, HP offers a robust set of blade hardware solutions that span the uni-, dual-, and quad-processor spaces. With this set of hardware components, users can now implement essentially any application that is available to run on a rack-optimized or pedestal ProLiant server. The most common use of e-Class blades is for front-end infrastructure workloads, while p-Class two- and four-way blades are best suited for the application and database tiers of the datacenter.

HP has developed a series of templates to illustrate how the ProLiant blade offerings fit into a host of common business solutions. As an example, Figure 3 illustrates how the ProLiant blade portfolio can be leveraged for an ecommerce solution. Additional sample blade solution architectures are available on HP's Web site.

FIGURE 3

PROLIANT BLADE INFRASTRUCTURE FOR ECOMMERCE



Source: HP, 2003

HP's Blade Server Alliance program has also demonstrated other benefits, offering a proving ground for HP to evaluate new technologies and form closer relationships with specific vendors that provide customers with enhanced value. In addition to its effectiveness as a proving ground, the program is also a clear indication of HP's commitment to integrating both HP and partner technologies into a blade server platform to deliver a seamless solution to the customer — especially for blade management.

This program has already witnessed success with one of HP's early partners, Altiris, in the streamlined deployment and redeployment of HP servers. Building off the Altiris solution, HP has developed the HP ProLiant Essentials Rapid Deployment Pack (RDP) for its ProLiant server line. This GUI-based solution allows users to drag and drop preset configurations onto ProLiant servers. The RDP software also allows for blade deployment via scripting and has built-in script-generation capabilities. With respect to controlling the expense associated with deploying servers, RDP allows users to quickly and easily add blades or replace a blade should one fail. This is especially useful in the scheduling of ongoing provisioning and reprovisioning of a pool of blades.

Rapid Deployment Pack from HP is only one in a series of management and efficiency packages under the ProLiant Essentials banner. The ProLiant Essentials Foundation Pack ships standard with every ProLiant server and contains:

- HP SmartStart for streamlining single-server setup and faster consistent server configurations
- Active Update for automatic download of software updates for most server products
- Insight Manager 7, the core of the ProLiant Essentials Foundation Pack

The Foundation Pack can be supplemented with ProLiant Essentials Value Packs — optional management products for enhanced server management. Value Pack products include Performance Management Pack, Rapid Deployment Pack, Recovery Server Option Pack, Integrated Lights-Out Advanced Pack, and Workload Management Pack. These products enable customers to analyze performance data, quickly provision new software, offer basic high-availability services, and dynamically allocate system resources to different applications running on a single system.

ProLiant Essentials are designed to provide seamless manageability so that RDP booting capabilities for the headless remote deployment of the blades can be combined with the remote power and remote console capabilities in HP's Insight Manager and Lights-Out management products to effectively manage the pool from even geographically dispersed locations. Rapid Deployment Pack also enables (through a multicast capability) the deployment of hundreds of blades simultaneously. Patches, upgrades, and new software can be added to the pool at minimum time and cost. It is this combination of HP blades' Lights-Out capabilities and RDP offering that provides customers with a robust yet streamlined way to manage a flexible and scalable infrastructure. These software components, which fall under the HP Adaptive Infrastructure vision, provide the granular components and the overarching vision of the next generation of datacenter management, automation, and (eventually) virtualization.

The Adaptive Infrastructure program refers to technologies that bring business agility to technology infrastructure. The Adaptive Infrastructure vision is based upon three interrelated core capabilities that are woven throughout HP server, software, and storage products:

1. Continuous and secure operations
2. Automated and intelligent management
3. Dynamic resource optimization

HP's Adaptive Infrastructure vision is the driving force behind the products HP is developing to enable its customers to enhance the management of business services run on their infrastructures. Table 3 illustrates HP's categories and management tools.

TABLE 3

HP ADAPTIVE INFRASTRUCTURE CATEGORIES AND MANAGEMENT TOOLS

Automated and Intelligent Management	Continuous and Secure Operations	Dynamic Resource Optimization
HP Insight Manager 7 for ProLiant server monitoring	HP Insight Manager 7	HP Rapid Deployment Pack for initial server software setup, software deployment and maintenance, and blade server recovery
HP Remote or Integrated Lights-Out Management for remote consoling and server recovery and maintenance	HP Performance Management Pack for identifying performance issues	HP Workload Management Pack for ProLiant server workload resource allocation
HP OpenView — Network Node Manager for network device management	HP Recovery Server Option Pack for server maintenance	VMWare — virtual partitioning

Source: IDC, 2003

Recognizing that blades are more than just a new hardware form factor, potential customers are encouraged to consider vendors that can deliver an ecosystem surrounding the blade platform. Specifically, a robust set of tested and certified hardware and software solutions — along with a host of options regarding the planning, acquisition, and deployment of a modular computing environment — must be considered when electing a solution provider. In short, customers need a blade vendor to be able to not only deliver a broad portfolio of internal and external hardware and software products but also provide the planning, consulting, integration, and management services necessary to deliver a total business solution.

THE ECONOMIC BENEFITS OF BLADES

Today, the most significant opportunity to contain and lower the cost of business services at the end user's site lies in the effective management of a large datacenter. IDC estimates that, on average, approximately 60–70% of server life-cycle costs are associated with management (e.g., server deployment, maintenance, tuning, platform migration, upgrades, and reconfiguration). The idea of better server management is especially critical for the development of a robust blade ecosystem — a trend that HP has identified early and moved aggressively to address.

While the cost of management occupies the largest share in the total cost of ownership, most users still identify a range of opportunities for cost savings across the entire server life-cycle spectrum. They identify both strategic and tactical initiatives to contain and improve productivity in all stages of life-cycle management; these stages are acquisition, planning, initial deployment of servers, ongoing maintenance, upgrades, and finally the reprovisioning of new servers.

HP's blade server ecosystem — the combination of hardware capabilities, internal software solutions, HP services, and the partner program — addresses the need for life-cycle services in the following ways:

- **Planning.** Blades require some upfront planning; however, this planning pays off quickly in terms of savings on the installation and management of new and redeployed blades. HP's power planning tool, available at **www.hp.com**, provides users with important power and thermal information needed for initial planning as well as a list of SKUs required to provide a complete solution.

- **Acquisition of resources.** Blades offer a pay-as-you-go model of scaling resources. Adding additional blades is less expensive than adding additional rackmounted servers, as components such as power supplies, cooling fans, and hardware interconnects are shared across all blades. The upgrade and replacement blades are also less costly: The p-Class enclosure and power are designed to support multiple generations of ProLiant blades so that customers don't have to repeatedly reinvest for basic infrastructure with every server blade.

- **Deployment of new resources.** With blades, the physical deployment simply requires plugging blades into the enclosure. This process is infinitely more streamlined than that associated with traditional rack-optimized servers, which require intensive installation services such as cabling and physically mounting the box in the rack. The deployment of software onto the blade is streamlined using the aforementioned RDP, allowing users to reduce new server installation time from hours to minutes.

- **Maintenance.** The consistent initial deployment process provided by the HP Rapid Deployment Pack significantly reduces the need for service to address software and configuration errors. Additionally, because of the modular architecture, server accessibility is greatly enhanced. Because of the hot-swappability of blade components, downtime due to mechanical failure can be minimized. Finally, a higher level of availability is achieved because of the limited number of components on each server and the considerable cable reduction for both power and networking (greater than an 80% reduction). Hardware and software upgrades are expedited as follows:

  - **Hardware upgrades.** Replacing a failed blade is simply a matter of removing the offending hardware and replacing it with a new unit. The RDP logs this action and redeploys the image onto the replacement server blade automatically.

  - **Software upgrades.** Software tools such as the HP Rapid Deployment Pack can quickly provision new or upgraded operating systems, applications, or patch images in a multicast manner to any number of devices.

- **Evolution.** Effectively, changing the service on a blade becomes a drag-and-drop event in a blade environment. This reprovisioning of services saves time and resources while maximizing hardware utilization — guaranteeing a high level of software stack consistency (identified as one of the largest sources of downtime in previous industry studies).

IDC believes the combination of blade management solutions and services can significantly lower expenses, both in terms of capital acquisition and the ongoing operation of infrastructure. Blades give users a means to lower power consumption and reduce floor space and rack space requirements. They also provide forwards/backwards investment protection to manage capital costs; however, the operational cost reductions ultimately have the largest impact on total cost of ownership and return on investment. Through initiatives such as the HP Adaptive

Infrastructure and Lifecycle Services programs — along with products such as Rapid Deployment Pack and Insight Manager and remote management offerings — HP delivers improvements in operational efficiency and helps customers lower their costs of computing. Blade hardware and software products are designed to deliver dramatically improved levels of automation and virtualization to today's datacenters.

BLADES AS A METHOD OF INTEGRATION

The focus on blade ecosystems reflects a need and desire for the higher level of infrastructure integration that has emerged over the past few years. During the exuberant period surrounding the run-up in the dot-com companies, a tremendous amount of pressure was placed on companies to develop and deploy a robust IT infrastructure. Users responded with a series of point solutions that ultimately created a mass of isolated islands of computing that were challenging to manage and extremely inefficient. IT suppliers have responded to these customer challenges by providing more integrated IT infrastructure solutions so that the business process this equipment supports is not only more available but also more flexible and responsive to the changing business drivers. This motivation reflects a need for higher levels of business agility, which is obtained through an infrastructure that is both flexible and integrated.

Server blades fit the bill in that the platform offers a modular approach to not only the development of the chassis but also in scaling the infrastructure. Because the server blade chassis is modular, customers have the ability to configure the package to fit their exact needs. For instance, the ProLiant p-Class chassis offers the ability to integrate into enterprise storage systems via chassis-based SAN connections. It also offers either NAS or direct attach storage connectivity — an absolutely critical component for enterprise customers that require connectivity into an existing storage network.

Blade networking is also highly configurable, with the BL p-Class chassis offering either an integrated switch or direct patch panel access to deliver a considerable reduction in cabling over standalone servers. Additionally, a choice of cabling options gives customers added flexibility in the configuration of a customized blade system. Further, the chassis are designed to fit in any rack system — from HP ProLiant racks to most third-party, four-post systems and two-post, telco-style racks. Finally, because the BL p-Class chassis can be leveraged across both the BL20p and the BL40p, users can mix and match both dual-processor and quad-processor systems for a custom integrated solution.

BLADES FOR SERVER CONSOLIDATION

One area of early integration traction for blades has been around server consolidation. While server consolidation has a variety of meanings, blades have found particular application with customers engaged in centralization and physical consolidation of servers in the datacenter. Table 4 illustrates IDC's spectrum of consolidation processes. Although data and application integration are the most strategic options, the tactical consolidation approach of centralization and physical consolidation makes up the bulk of today's consolidation activity.

Specifically, blades play a role in the consolidation processes in that they enable the customer to easily physically consolidate multiple servers into a single managed entity. Blades also typically have integrated switching capability. Therefore, by physically consolidating rack-optimized servers to blades, a layer of static switching can be consolidated as well. Finally, blade customers are able to save space relative to today's rack-optimized solutions — in some cases, cutting the cost of datacenter floor space in half.

TABLE 4

IDC'S SERVER CONSOLIDATION SPECTRUM

Centralization	Colocating servers into fewer locations
Physical consolidation	Consolidating same application types onto fewer or larger systems
Data integration	Combining data with different formats onto a similar platform
Application integration	Consolidating servers supporting different types of workloads onto fewer or larger systems

Source: IDC, 2003

HP has recognized that, by consolidating servers into a chassis, users have the ability to streamline infrastructure management to improve the operational efficiency of the datacenter and reduce the demands on the IT administrator. In total, blades are allowing customers to centralize and physically consolidate servers as well as a level of network resources to deliver capital and operational benefits.

New Balance Steps Ahead

In April 2003, IDC conducted an interview with one of HP's ProLiant server blade customers at the recommendation of HP. Although one case study is certainly not large enough to establish a general market trend or perception, it does provide a snapshot of how one customer perceives the benefits associated with a server blade deployment.

Pierre Baudet, a business systems manager for New Balance Athletic Shoe Inc., based in Boston, was feeling a need familiar to many IT managers in the market today — the need to reduce costs and deploy an IT infrastructure that provides better return on investment. Of primary concern to Baudet was deploying a server solution that provides better manageability and efficiency and reduces the costs and time associated with system deployment.

After considering several different options, New Balance deployed HP ProLiant BL20p blade servers to meet these challenges. The BL20p solution integrated easily into the company's existing ProLiant infrastructure and permitted key management and interoperability features associated with the ProLiant family to be integrated with the server blade solution (such as hot-pluggable SCSI hard drives and HP's Insight Manager solution). "I didn't hesitate about purchasing a two-processor (2p) ProLiant blade server because I was familiar with ProLiant investment protection and the drive compatibility," said Baudet. "I am also very comfortable with the fact that ProLiant blade platforms are easy to mix, match, and manage."

With the ProLiant server blade solution, Baudet believes his server deployment time has decreased from 2.5 hours to only 15 minutes. During the same time period, New Balance's server compute requirements increased; however, Baudet's IT staff remained the same size. Baudet emphasized this point, saying, "We used to deploy 2 to 3 servers per month. Now we may deploy 2 to 3 servers in a week, but with the same number of staff."

By implementing a server blade solution, New Balance achieved an easier scale capability and realized management cost savings. By having the capability to schedule backup functions for its ProLiant servers, the company also gained more efficient use of its server resources (such as CPUs, I/O, and rack space). "We are absolutely thrilled to have ProLiant blades," said Baudet.

CHALLENGES/OPPORTUNITIES

The blade server initiative will face several challenges that revolve around the immaturity of the market and the relative youth of enterprise blade technologies. In general, more user education will be needed to continue to illustrate the blade value proposition and assure customers that blade servers provide the performance and manageability needed in enterprise IT settings. HP has taken an early leadership role in the development of server blade technology and in the promotion of an ecosystem approach to market development.

With respect to blades and management, the challenge of employing even more granular and distributed infrastructure leads directly to an increased demand for efficient management. Today's enterprises are already struggling with the proliferation of servers in their datacenters — computing blades run the risk of only exasperating the issue. To successfully migrate the market from rack-optimized servers to blades, leading vendors will need to develop management tools and illustrate their benefits (which include a robust and automated provisioning system). Therefore, HP is aggressively bringing forth many management tools specific to blade architectures. These products will be critical for HP because they will help differentiate its blade server ecosystem from the other available blade offerings.

HP's strength as a major system supplier gives the company an edge in its efforts to develop a full suite of management, automation, and virtualization solutions to include on the server blade architecture. An aggressive schedule for the development of these tools — along with strong third-party relationships, service offerings, and successful early customer wins — may provide HP with a strong foundation for the development of a necessary blade server ecosystem.

HP must find ways to continue to encourage independent software vendors (ISVs) to test and certify applications for its server blades. The full promise of the server blade architecture includes not just plug-and-play hardware components but also the ability to easily deploy and manage applications, combined with necessary processing resources. IDC believes that, over time, ISVs will be drawn increasingly to the blade opportunity because it offers a larger marketplace, a new distribution channel, and a partnership with established system vendors such as HP. This ecosystem approach is beneficial to HP in that it offers a differentiated strategy from those of its competitors and rapid access to a range of software solutions.

In addition to addressing the software and management concerns, HP (along with the market) will face concerns regarding the hardware aspects of the blade environment — specifically, concerns raised by potential customers regarding hardware standards and chassis investment protection. HP is addressing these concerns by emphasizing its efforts to ensure that next-generation blades work with existing chassis and that blade chassis are ready to accept future feature upgrades.

A clear and demonstrable proposition of the economic benefits associated with the implementation of blades and the management framework has already worked to greatly reduce perceived risk associated with migrating to a blade ecosystem of business solutions. To this end, a strong early adopter experience with HP server blades will be critical to the second, larger wave of IT buyers expected to emerge in the coming months. Customers will look to HP to provide details on the lessons learned and insight gathered from previous blade server engagements.

Finally, HP must continue to increase customer familiarity not only with the server blades but also with the value proposition of the server blades. Potential customers must understand the potential benefits of blades, and HP will need to reinforce the commitment behind its message. Only through consistency and understanding will customers take the step into the next phase of computing.

CONCLUSION

HP's ProLiant blade server products are an important initiative that will continue to change the design and deployment of server technologies over the coming years. IDC believes that blades have extended beyond the early demand driver to increase server density and lower power consumption. Today, HP couples a portfolio of blade products with an ecosystem of operating system application partners and a wealth of tools to enable more efficient datacenter automation, virtualization, and management. This ecosystem approach combines to deliver IT infrastructures oriented toward providing business solutions while lowering both the capital and operational costs of computing. Datacenter managers, third-party service providers, and enterprise IT planners are encouraged to monitor early adopter activity in this domain, as HP and its partners deliver blade server solutions to the market.