WHITE PAPER

Broadening the Blade Systems Portfolio

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EXECUTIVE SUMMARY

Over the course of the last few years, blade servers have attracted the attention of mainstream customers in the server market and are quickly being deployed across a growing spectrum of companies in all markets. Through their experiences, early adopters have offered up example after example of the financial metrics and benefits associated with blades, driving today's customers to embrace this relatively new server form factor. Cost savings, greater manageability, ease of use, and added flexibility are among the key factors cited by users for choosing the blade platform.

Today, IT managers are challenged by the technology sprawl that has occurred in the past few years as the need for scalable infrastructure to meet the ever-changing business demands has driven up server volumes. Blades offer the advantages of not only a level of server density and a straightforward scale-out strategy, but also a simplified environment as blades integrate associated resources — power, storage and networking equipment — into a consolidated chassis that can then be managed through a single interface. The modularity of blade solutions provides flexibility in building out IT infrastructure that will deliver organizations their competitive edge.

Blades are not only adopted by large-size, mainstream corporations, but increasingly they are becoming the server form factor of choice for midmarket companies as these organizations recognize the advantages associated with this server form factor. The expanding portfolio of blade systems products — including blades, processor choices, networking and storage options, support for multiple operating systems — is contributing to greater mainstream adoption of blade technology.

Blade servers have become a firmly established technology, illustrated by the rapid growth in this segment of the server market. Vendors are fully committed to blade technology as they continue to make investments to broaden their blade server portfolios. The enrichment of the surrounding blade ecosystem has encouraged mainstream customers to deploy blade servers to support even mission-critical business processes. By taking a solutions approach and providing customers with more choices, vendors are enabling users to choose the right tool for the job and adopt blade systems at their own pace.

IT MANAGEMENT CHALLENGES

To provide enhanced business value, IT managers are increasingly looking beyond point solutions to find better ways to manage IT resources. There is a current move underway to manage IT more comprehensively. This "holistic" approach is no longer being used just by large businesses and enterprise customers, but is increasingly permeating the small and medium-sized business (SMB) market. Managers in all segments realize the essential need that exists to address issues at the business service level. These challenges include:

☑ **Application availability**. Increasingly, business is done on a 24 x 7 basis, which in turn means that business services must be up and running almost constantly. Because of this requirement, applications and the underlying infrastructure that enable the business services need to be available constantly.

☑ **Application performance**. Increasingly customers are deploying applications to a broad constituency that includes employees, partners, and suppliers. The performance of these applications is critical to enabling business benefits from the IT infrastructure.

☑ **Infrastructure scalability**. The ability to easily scale the infrastructure to support more users and new applications is another area where companies are looking to enhance their capabilities as they begin to grow their IT infrastructures after the last few years of IT budget lockdowns.

☑ **Better alignment of IT resources with businesses' priorities**. Businesses are increasingly looking to harness the power of scale in order to improve the cost of ownership. Therefore, organizations must squeeze more flexibility and capacity from their infrastructure. The ability to leverage IT resources that can be used in multiple ways is critical to unlocking the value of the IT investments.

☑ **Simpler infrastructure management**. To reduce costs, minimize mistakes, and streamline the infrastructure management process, companies are increasingly seeking technologies that allow for the automation of day-to-day tasks.

☑ **Reduced total cost of ownership.** Demands to reduce the total cost of IT expenditures continue as a major focus area to improve the efficacy of IT. Opportunities for cost reduction are most promising when IT managers can contain and lower the cost of managing infrastructure as IDC estimates that, on average, approximately 60–70% of server life-cycle costs are associated with infrastructure management.

In order to manage these challenges more effectively, some IT managers are looking to hardware vendors as partners for deploying comprehensive solutions across their IT environments. One method by which these issues are being addressed is through the additive deployment of blade server systems. The aim of this paper is to examine blades and identify key elements of the solution, which may help customers in addressing these challenges in the IT environment.

BLADE MARKET OVERVIEW

Blades Moving into the Mainstream Market

After three years of active shipments into the market, blade servers have moved from a niche opportunity in the high-performance computing (HPC) and Web-serving markets to the beginning phases of mainstream market adoption. In 2004, shipment of blade servers totaled more than 306,000 units, capturing nearly 5% of the overall server volume in comparison to just 3.5% in 2003. The growing share of blades is a reflection of the increasing acceptance of blades as a viable server form factor across nearly all industries and company sizes. The growth of blades is also attributable to the commitment the server hardware vendors are making to this new server platform.

As the blade market matures, the technology is being adopted in all parts of the world and is no longer a phenomenon limited to the developed markets. Initial blade deployments mainly were in well-established markets such as the United States and Canada, which traditionally have been quick to embrace new technology. Therefore, it is not surprising that these two countries have the highest blade server penetration rates (see Figure 1). While the emerging markets have been slower to adopt blades, regions outside of North America are seeing a larger share of new blade server growth. IDC believes this is the result of customers seeing proof that blades are delivering on the early promises of reduced costs, increased service availability, and enhanced productivity, and, moreover, that blades are the form factor of choice for the computing platform in the future.

FIGURE 1

Blade Server Penetration by Region
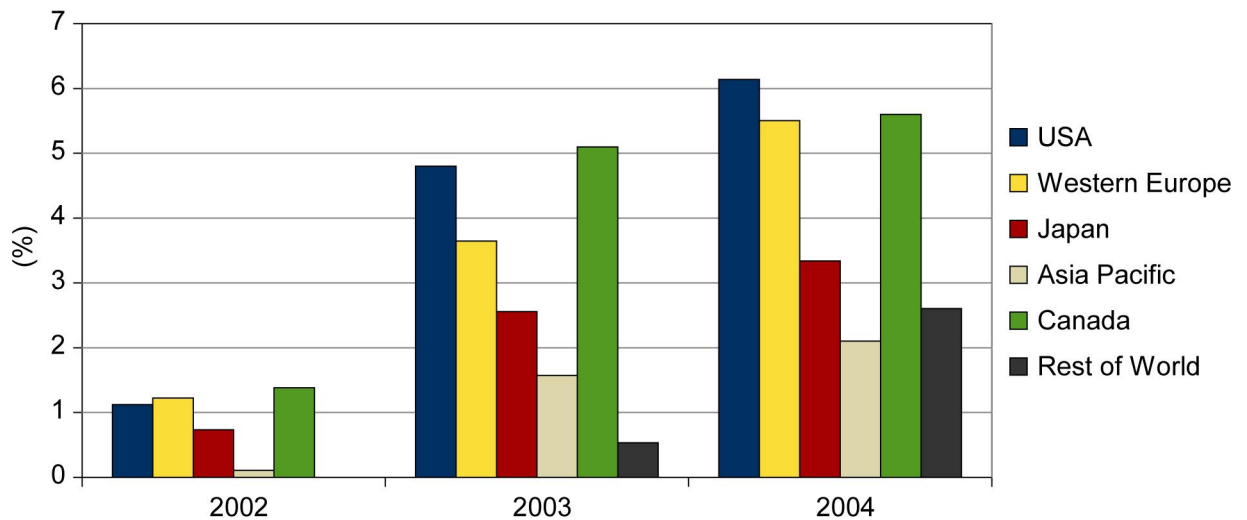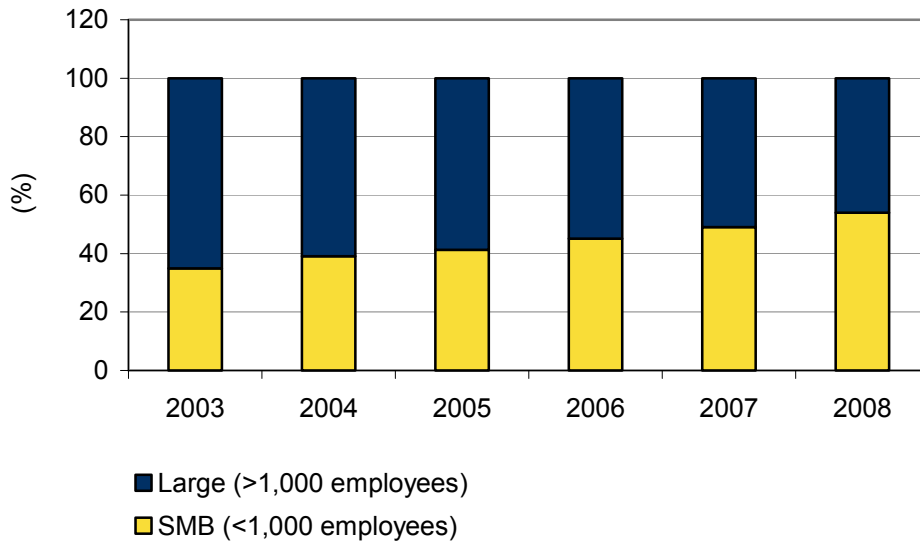

Source: IDC, 2005

As early adopters become more familiar with the technology, they are readily sharing their deployment experiences and providing concrete evidence of both the technological and fiscal benefits blades offer across large-, medium-, and small-scale deployments. Such testimonials offer real-life cost-saving metrics and performance benchmarks to validate the blade concept and the promised benefits. This in turn is helping more mainstream customers understand and evaluate blade technology, as they are able to see how their peers — whether by industry or by company size — are benefiting from blades.

In particular, blade value propositions have begun to resonate with small and medium-sized companies. Unlike large corporations that have substantial IT departments staffed with numerous administrators and specialists, small and medium-sized businesses often have fewer resources at hand and must manage more with less. For these SMB customers, the blade form factor offers a complete solution that integrates servers, storage, networking, and power into one chassis, as well as the management functionalities into a single console. This all-in-one approach has proven especially beneficial for administrators that are tasked with running all aspects of IT.

Additionally, the modular approach of blades gives companies the flexibility and scalability to add compute capacity as the business needs change and grow. As a result, SMB customers, especially those in the midmarket, are increasingly choosing the blade form factor. IDC research shows that the SMB segment contributes to roughly 37% of the blade server volume today, and a trend of greater blade usage by this customer set is projected to be on the rise (see Figure 2).

FIGURE 2

Server Blade Outlook by Company Size

Source: IDC, 2005

As blades make their way into the mainstream market, including customers from small and mid-sized organizations, deployments continue to increase. Worldwide blade server shipment grew 66% in 2004, and since 2002 — the first year of product shipments — the market has grown nearly 700%, making blades by far the fastest growing server form factor.

User Adoption Trend of Blade and Rack-Optimized Servers

By comparing the adoptive trend of blade and rack-optimized servers, we can begin to see how blades have gained broad market acceptance (refer back to Figure 2). While blade shipments in the first two years of product availability closely mapped to that of rack-optimized servers, blades surpassed the rack-optimized form factor in year 3. In year 3, blades units sold nearly three times the rack-optimized servers shipments in 1998, three years since rack-optimized servers were initially introduced in 1996. This data shows that blades are being adopted quicker than any other form factor, and IDC believes this not only shows how quickly blades are becoming mainstream but also how the value proposition of the platform is being identified by customers.

Shift in Operating System

The move toward the mainstream market is also observable in the shift in operating system mix. Because the initial blade deployments were mainly in HPC environments and for Web-serving applications, a higher percentage of the blade portfolio in the early adoption years was Linux-based. However, in 4Q03, shipments of Windows-based blades exceeded those of Linux-based blades for the first time, and this trend has since continued. This cross-over point occurred around the same time blade servers began to experience a ramp up in wider market adoption from early adopters to more traditional large enterprises, and, especially, small and medium businesses. This point is particularly significant when considering the high levels of penetration of Windows OS within the small-sized business customer market.

Windows accounted for about half of the blade server shipments in 2004. This penetration ratio is low compared to other server form factors where 60% of rack-optimized servers and 72% of non-rack-optimized server were running Microsoft Windows. Using the rack-optimized adoption pattern as a guide, Windows-based blades can be expected to increasingly gain share as mainstream adoption extends further to small and mid-sized businesses (see Figure 3). While Linux and the associated tools and services have matured immensely over the last few years — and will subsequently continue to represent a significant opportunity going forward in the blade server market — ultimately, IDC still believes the greatest opportunity for blades lies with Windows, and this operating system will be a key driver for future blade unit growth.

FIGURE 3

Blade vs. Rack Server Adoption
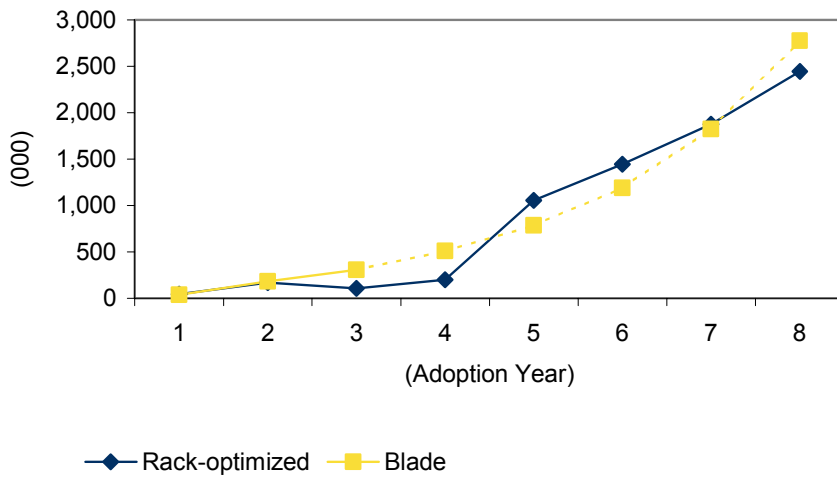
Source: IDC, 2005

Expansion of Blade Portfolio

Having a broad product portfolio enables customers to choose the right tool for the job. Initial blade offerings only included choices by processor capacity, from 1-, 2-, to 4-processor configurations. While these blade configurations were largely suitable for scale-out deployments of infrastructure workloads and application tier, customer interest in using blades for scale-up databases and other mission-critical services meant that vendors needed to provide a broader set of blade solutions to meet a large variety of computing needs. In the past year, the more aggressive blade vendors have responded by introducing different blade products with a variety of processor types, additional operating system support, and interconnect choices from leading technology providers and partners. IDC believes this expansion of the blade portfolio is a necessary condition to continue to drive the adoption of blade technology by the wider market.

Today, customers have many more choices with blades. These choices extend across multiple levels, including processor capacity, processor type, operating systems, blade form factor, networking and storage options. Additionally, blade vendors have come to market with tightly integrated blade-based solutions that center on the specific workload needs of their clients. These solutions extend from scale-out deployments for infrastructure applications to 4-way blade systems for compute-intensive workloads like databases of business intelligence.

This solutions-based approach is about also working to create a server blade ecosystem as server vendors partner with networking companies to deliver best-of-breed platform options. Vendors such as HP have identified this requirement and

have begun to offer solutions based on networking options from the preexisting networking and storage interconnects for rack-optimized servers. By partnering with firms such as Cisco and Brocade, companies like HP are leveraging their preexisting relationships in order to deliver best-in-class solutions to customers today. Further, this solutions-based approach to bringing products to market will influence user perceptions of the utility of this new approach to server infrastructure, which, in turn, will help drive the adoption of blade technology.

HP BLADESYSTEM OVERVIEW

As the first tier 1 server vendor to introduce and ship blade servers, HP has taken a leadership role in the development of blade server solutions. The company has assembled a full range of products in its blade portfolio that can be considered one of the most robust and comprehensive set of offerings in the market today.

As shown in Table 1, HP BladeSystem encompasses 2- and 4-processor configurations, Intel and AMD processor brand choices, form factor options for the desired density, modules supporting Cisco and Brocade switches for both Ethernet and Fibre Channel, pass throughs for those that already have switches, as well as a wide range of OS options.

TABLE 1

HP BladeSystem Product Overview

Processor Capacity	Model	Blades per 6U Chassis	Processor Brand
2-way	BL20p	8 blades	Intel Xeon and Xeon with EM64T
	BL25p	8 blades	AMD Opteron (including dual core)
	BL30p	16 blades	Intel Xeon
	BL35p	16 blades	AMD Opteron (including dual core)
4-way	BL40p	2 blades	Intel Xeon
	BL45p	4 blades	AMD Opteron (including dual core)

Networking options: Cisco Gigabit Ethernet Switch Module, Brocade Fibre Channel Switch, RJ-45 patch panels

Operating systems options: Microsoft Windows, Linux (Red Hat and SuSE), NetWare, SCO UnixWare, SCO OpenServer, IBM OS2 Warp Server

Source: HP, 2005

By taking a customer-oriented approach, HP is giving buyers the choice and flexibility in building out their blade infrastructures. On top of dual- and quad-processor configurations, HP offers a variety of form factors to satisfy different processor density requirements. Whether it is density, performance, or price/performance the customers

are seeking, users will be able to closely match their computing requirements with a specific blade server architecture and environment from HP.

With all the options available in BladeSystem, HP offers one of the broadest and most diverse product portfolios in the blade industry. HP has deliberately built BladeSystem to give customers all the tools they need in deploying blade solutions.

Consolidation is a key blade solution area as many users are leveraging blades to centralize and manage the IT sprawl that has occurred over the last few years. As a part of that consolidation effort, not only are customers turning to blade servers to achieve a great level of server density, but more critically, they want to simplify their IT environments.

This drive to use blades to address some of the fundamental challenges that IT administrators face in their environments is causing the vendors to develop blades as part of an overall solution. HP is packaging the BladeSystem infrastructure with software tools and storage options aimed to help customers create solutions that allow them to better manage and control their IT resources. HP also offers support and integration services to round out the solution set. These offerings have HP consulting with the users and assisting them through the blade deployment and integration process.

Choice in Processor Type

Recently, HP has taken its commitment to customer choice one step further by offering a choice at the processor brand level where users can select either Intel or AMD chips on blade models. Customers can freely decide based on the preferred processor brand or the applications/workloads in question, rather than being restricted to a single processor family.

IDC research shows that servers based on the Intel Xeon processor family are typically considered general-purpose systems suitable for file/print, basic infrastructure, and other cache-sensitive applications. In comparison, because of an architecture designed for low-latency, AMD Opteron-based servers are more likely deployed in support of compute-intensive, high-performance workloads, such as databases and financial modeling as well as for HPC nodes in a cluster. Additionally, HP is fully supporting AMD dual-core technology across the BladeSystem product portfolio.

Small and medium-sized businesses (SMB) have historically favored Intel processor systems, similar to the case of a high penetration of Microsoft Windows in this customer segment. Now with AMD Opteron blades available from HP, SMB customers have an alternative platform as they evaluate how best to consolidate the database servers or to migrate some of the business-critical applications. By taking this "chip-nostic" approach, HP's goal is to provide users the best performance and price/performance blade solutions in the industry.

Networking Portfolio

HP is also integrating more widely available networking technologies into the BladeSystem portfolio. In the interconnect area, the company is taking the strategy of expanding its networking options through partnering with industry leaders to provide the best-in-class solutions. Four key additions to the networking portfolio are:

☑ **Cisco Gigabit Ethernet Switch Module**. Introduced in January 2005, this switch module is specifically designed for the HP BladeSystem p-class enclosure. This integrated switch reduces the cabling requirements and the number of network connections to manage, thereby improving reliability and manageability.

☑ **Nortel Gigabit Ethernet Switch Module.** HP has also announced a relationship with Nortel to offer an Nortel Ethernet switch option to complement its Cisco offering. The product, announced in March of 2005, is expected to be introduced later this year.

☑ **Brocade 4Gbps Fibre Channel Switch Module.** HP and Brocade Communications Systems have announced plans to offer the first embedded Fibre Channel fabric switch for the HP BladeSystem. Integrating storage area network (SAN) switching into the chassis will eliminate the fabric switch infrastructure components necessary for SAN connectivity in bladed environments.

☑ **McDATA 4Gbps Fibre Channel Switch.** HP teamed with McDATA to introduce the latest in the M series family of Fibre Channel switches available from HP to enable customers to connect HP BladeSystems to Fibre Channel SANs. With the introduction of the new McDATA 4Gbps SAN Switch, IT managers now have the capability to consolidate multiple HP servers, Fibre Channel switches, and Ethernet switches into a single platform for connectivity to the networked infrastructure.

Because HP is jointly developing these solutions with Cisco and Brocade, the switch modules are fully compatible and consistent with existing technologies from those respective hardware vendors. HP also teams with Q-logic and Emulex for the Fibre Channel mezzanine cards that are paired with each blade. IDC believes this will provide an added level of investment protection for HP customers.

Operating System Portfolio

As most customers are running multiple OSs in their IT environments, it is crucial for blade suppliers to provide a broad base of choice at the operating systems level. In addition to Microsoft Windows and Linux distributions from Red Hat and SuSE Linux, HP has continuously been increasing the number of OS choices supported on BladeSystem servers (see Figure 4).

Blade Server Shipment Forecast by Operating System,
2002−2009
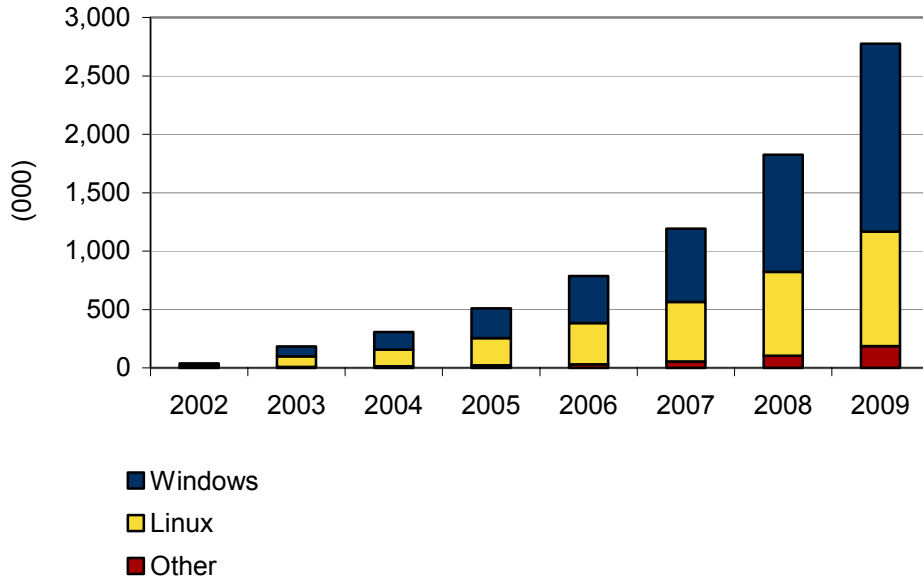
Source: IDC, 2005

BladeSystem Management Tools

In addition to a broad portfolio of blade server hardware, HP offers customers a suite of software tools that not only enhances the value of BladeSystem products, but more importantly serves as a point of differentiation for HP in the blade server market. Because HP integrates and optimizes infrastructure management capabilities for the blade environments, customers can easily automate, virtualize, and manage their blades from a single console. With such simplified management tools, customers can lower management costs, increase efficiency, and enhance productivity as they are able to relieve IT managers from performing mundane and time-consuming tasks.

The HP BladeSystem integrated environment incorporates HP Systems Insight Manager (SIM) 4.2 and expands on capabilities designed to simplify and streamline management of HP blades. Through this software, users are able to manage blade servers, enclosure infrastructures, racks, and integrated switches (including the Cisco Gigabit Ethernet Switch Module).

Each HP blade also comes with an embedded Integrated Lights-Out (iLO) management chip on the system board. Through iLO, users are able to remotely manage and configure HP blade servers, eliminating the need for keyboard, video, mouse (KVM) switches for each blade enclosure. In addition, ProLiant Essential Rapid Deployment Pack (RDP) is the automated deployment and provisioning tool for BladeSystem.

HP delivers additional management functionalities suitable for blade servers via plug-ins to the HP Systems Insight Manager.

☒ **ProLiant Essential Intelligent Networking Pack.** This networking product allows blade servers to adapt and change network path to the most optimal route. The ability to detect and avoid network bottlenecks helps to provide high network reliability and performance.

☒ **HP Power Regulator technology.** This technology provides the ability to throttle server power to improve energy efficiency, which can reduce power and cooling costs as well as help prevent system failure due to thermal events.

☒ **HP ProLiant Essentials Vulnerability and Patch Management Pack.** This software pack assesses certain vulnerabilities and then deploys patches to help maintain system health and security. Especially for SMB customers, this is an effective and time-saving product that helps IT staff keep updated with new vulnerability releases and security patch updates.

☒ **Virtual Machine Management Pack.** This product provides a unified management and control tool for virtual machines (VMs) from Microsoft and VMware. The tool helps ease management of VMs by providing a consolidated view of VM and host server resource consumption. Users can easily provision and allocate resources as capacity requirements change due to the inherent ability to manage virtual machines from both Microsoft and VMware through one unified view.

☒ **Automation Pack.** This pack enables policy-driven, automated action across groups of blade system resources. The end-to-end provisioning and automated recovery capabilities will help free up personnel from these time-consuming tasks.

In addition to these offerings, HP is making strategic investments in innovative software manageability technology to further this differentiating capability. Novadigm and Consera are two recent acquisitions aimed at the change management and virtualization market spaces, respectively. Customers can expect the company to bring new management features and functionality to market through the SIM platform. In this way, HP plans to continually refresh its management portfolio and offer customers the latest innovations in infrastructure manageability.

BladeSystem Storage

In addition to the broad range of blade and management options, HP offers a wide range of storage options for its BladeSystem products so that users can choose how they access the storage in their environments. There are HP local storage options for direct-attached storage environments, and there are HP StorageWorks products and certified third-party SANs compatible with HP blade servers for networked storage options. This flexibility offers customers a choice, as well as investment protection for existing storage infrastructure. A key advantage of attaching HP storage is the assurance of commonality and integration. HP blade servers and StorageWorks products are not only designed to be compatible but fully tested to ensure complete

end-to-end computing and storage solutions. Customers are able to manage both HP blade server and storage through a common management tool/interface. Additionally, HP storage tools provide centralized data backup to tape, point-in-time snapshots and clones, and high-availability RAID protection, which are all designed uniquely to enhance data availability across systems.

HP Services Complement BladeSystem Offerings

Rounding out the blade solution set is a host of blade system services that are intended to assist users in quickly deploying and integrating blades into the IT environments. There are enough differences between blades and rack or pedestal servers that HP has found these services particularly beneficial to first-time blade users, especially SMB customers, that might be somewhat hesitant to deploy blade servers on their own.

HP has assembled a host of services to help customers ease through the initial blade deployment process. For example, HP provides assessment services on power and cooling, security, and support requirements to determine the environment's readiness. HP can also assist customers during planning to ensure the blade systems are optimized for their business needs and have the flexibility for future blade buildout. Additionally, HP will even build the systems to the customer's specifications and deliver the fully tested solutions through its Factory Express program.

CHALLENGES AND OPPORTUNITIES

Despite the broader market adoption blades experienced in 2004, there are still challenges. IDC believes HP, along with other blade vendors in the x86 market, must overcome these challenges in order to continue to build on the mainstream market adoption that has already begun. These challenges include:

▱ **Keeping a customer focus.** With so much attention on the blade form factor and technology options in the market today, blade vendors will be challenged to remain customer focused in the partnerships they choose to make and the solutions they choose to create. HP will need to draw upon its experience in supporting companies of all sizes in their buildout of server, storage, networking, software infrastructure as well as its understanding of these customers' needs in order to maintain a pragmatic approach to developing blade solutions.

▱ **Illustrating midmarket value.** As part of its marketing effort for the midmarket, HP will need to clearly articulate how small and mid-size organizations can map their needs to a complete blade portfolio. This includes creating a succinct value proposition that appeals to the market majority, continuing to drive down the cost of computing and networking, as well as highlighting the importance of IT infrastructure reliability, availability, and scalability to all customers. Key to this challenge is creating blade-based solutions that are relevant to small and mid-sized firms.

- ☒ **Cultivating the ecosystem.** As was stated earlier, while blades represent a new form factor, they go beyond just increased server density and instead are quickly becoming a platform. As such HP will need to continue to focus on working with partners across all aspects of the hardware, software, and services layers to create a blade ecosystem. This is evident in its commitment to deliver its customers multiple choices for the networking layer of the BladeSystem solutions This effort to add options and partners on the BladeSystem platform must continue to expand in 2005.

- ☒ **Alleviating concerns about blade standards.** Another barrier that must be overcome is that of the perceived lack of standards in these servers. IDC research shows that standards are important to mainstream technology users because standardization ensures price competition. as well as reduces choice in multivendor environments. As such, blade vendors must continue to demonstrate that price competition in the blade space will continue and users will continue to see value from such.

- ☒ **Demonstrating a long-term commitment.** Finally, some potential blade customers have concerns about the long-term viability of blade technology. While HP has proven time and again its ability to invent and bring to market next-generation technologies, in order to alleviate these concerns the company must continually reaffirm its commitment to the blade form factor across not just the server element of its BladeSystem portfolio, but also its switches, storage, and PC products.

CONCLUSION

Blade servers bring significant advantages over rack-optimized and pedestal servers. Their ability to leverage shared components, such as networking and power connections, combined with their flexibility in support of virtualized server resources, makes them a natural fit with today's push for consolidation across the IT organization. The unified management interface of blades helps enable IT personnel to effectively and easily configure, deploy, and manage multiple server resources from a single interface.

Understanding these benefits, many mainstream customers are already deploying blades in their IT environments. While the blade server market is rapidly growing, server vendors would be sorely remiss if they were to assume simply making hardware available will gain them market share. Crucial factors that will help determine the success stories in this market center on the forging of key partnerships to create a strong ecosystem, providing a comprehensive solution that includes management tools and deployment services, and which integrate seamlessly with storage and networking solutions in the datacenter.

CASE STUDY

To obtain a customer perspective on HP's new blade systems portfolio, IDC interviewed a customer nominated by HP.

Based in Jacksonville, Florida, DataRoad provides managed services to public and private clients and is a leading provider of Oracle-related services. Founded in 1997, the company offers comprehensive, preconfigured information systems to the SMB market. DataRoad also provides software and hardware upgrades, database administration, systems analysis, custom development, data migration, user training, and mentoring to its clients. It delivers services to its clients in an ASP-like datacenter model, with DataRoad owning and managing the infrastructure, but with the customer actually owning the Oracle license.

DataRoad decided in late 2003 to begin on a path to migrate its datacenter from rackmounted servers to blades. It wanted to drive the costs out of its infrastructure while maintaining the high reliability its customers required. DataRoad saw blades as a good fit with this basic need. However, the company also had several additional requirements that needed to be met in order to make the transition to blades. The company had found the Unix OS best suited its needs for high reliability and had been running Oracle on Unix prior to the transition. DataRoad saw Linux on blades as a viable path for migration and sought out a vendor to provide it, with the caveat that the supplier have a partnership with Oracle in order to be able to offer a single point of contact for the comprehensive solution. For DataRoad, HP fit the bill for several reasons. Key among these was HP's comprehensive support options, which provided support with DataRoad for Oracle on its HP BladeSystem servers. Of equal importance was the Rapid Deployment Pack (RDP), for server provisioning and deployment, as well as the Integrated Lights-Out technology (iLO), which enables DataRoad to manage its BladeSystem servers from an easy-to-use Web-interface.

"We were still a little bit skeptical," recalls John Vaughn, executive vice president of DataRoad, "but we started testing it out…[and] things ran surprisingly well. It was a fairly easy transition of our skill sets from Unix to Linux, with a minor learning curve because there is just a little bit of difference."

The company is now able to reduce start-up time for new customers down from days to minutes, literally. "If we sign a new customer tomorrow and that customer wants two servers, I can have those two servers deployed with standardized OSs on it in about 18 minutes…We can have that machine totally deployed with the OS on it, all the security patches, all the agents we need to manage the machine from an Oracle standpoint, so it comes up into our management infrastructure so we can begin monitoring immediately." As a result of HP's RDP for BladeSystems, DataRoad was able to reduce deployment and configuration time on blade from hours down to minutes. "All that is done and configured and standardized in 18 minutes," said Vaughn.

Because of HP's competitive pricing for its BladeSystem servers, as well as the increased price performance for HP blades as greater numbers are deployed, DataRoad was able to significantly reduce its acquisition costs. Through this

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reduction in capital expenditures as well as savings in operating expenditures, DataRoad has been able to offer its customers more competitive pricing. DataRoad additionally realized significant benefits in the management of the datacenter hardware as it transitioned to blades. "As our business grew, we ended up having 20, 30, 40 servers and as we added servers, that environment gets complicated," said Vaughn. "You have network cables, keyboard cables, mouse cables, and video cables for every machine you put in the rack, and you've got power…and if you try and add a server or take a server out, the risk of upsetting something else in the environment, the risk of something failing, goes up." The simplified structure of HP BladeSystem cabling, power and networking interconnects provided significant benefit to DataRoad.

"We wire it up, plug it up to the network once, and it's almost like a SAN," said Vaughn. "The same reason that people went to the SAN environment, where you do all that wiring one time and as you add disk drives, you just slide them into a slot and plug them in and turn them on and they work. The blades give us the same thing — so we can now focus on what we do best, which is Oracle."