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# The Value of Blade Solutions in the Healthcare Industry

Enabling the vision of an agile digital healthcare institution

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## DATAMONITOR VIEW

In today's challenging environment, healthcare executives struggle with not only delivering and managing top-quality patient care but also meeting the day-to-day demands associated with running any organization. Healthcare provider and payer organizations of all types and sizes, ranging from large academic medical centers to community hospitals, long-term care facilities, and physicians' offices, need to keep the delivery of patient care at the heart of their organizational objectives. Yet effectively sustaining focus on and achieving these objectives is no easy task: it requires institutions to empower clinical, administrative, financial, and information technology (IT) functions to support the organizational mission. In fact, IT solutions are an important component of helping hospitals, physicians' offices, and payers become more agile in meeting ongoing, and frequently changing, demands. Furthermore, IT solutions can play a role in enabling healthcare providers and payers to grow and face challenges that emerge down the road. While there is no silver bullet for achieving organizational agility, using blade solutions as part of a broader IT management strategy offers a compelling value proposition.

Key types of benefits that blade solutions can provide to IT departments and end users alike include:

- Technology: high availability and redundancy, enhanced application performance
- Organizational: reduced space constraints and energy requirements, agility to accommodate future IT growth
- IT staff and end users: accessibility to critical applications, more productive use of IT personnel

In this white paper, Datamonitor offers its perspective on the role that blade solutions can play in healthcare, highlighting how blade solutions can address the unique challenges facing healthcare organizations. In addition to providing case studies of two healthcare organizations that have leveraged blade solutions, this white paper also provides an example of one vendor's blade solution, HP's BladeSystem. Finally, Datamonitor offers its opinion on how healthcare organizations can decide whether blade solutions are a potential fit for their needs.

**Healthcare organizations operate in a challenging environment**

*Do questions of how to plan for the future while accommodating your organization’s current needs keep you up at night? Are you concerned about ensuring the security of your IT infrastructure and privacy of patient information? Is your organization running out of space?*

If you answered “yes” to any of these questions, you are not alone. Healthcare institutions today operate in a very challenging environment. Top of mind for healthcare executives is how to better align IT infrastructures to really support the “business” of healthcare. All facets of a healthcare institutions’ IT infrastructure – from servers to client PCs to storage area networks – need to not only support but also fully enable the organization to better do what it does best: deliver and manage patient care. Whether you represent a community hospital, academic medical center, long-term care facility, physician’s office, or a healthcare payer, never have the challenges of keeping a healthcare organization up and running been more complex than they are today.

The list of challenges facing the healthcare industry is long and varied. From reducing medical errors to improving the ability of a healthcare institution to retain clinician talent, there are few items that healthcare executives would say are *not* challenges that they face today. In interviews conducted with 103 healthcare executives, Datamonitor found that the challenges range from patient and employee issues to financial performance and regulatory compliance (see Figure 1).



### *Enhancing the quality of patient care and reducing medical errors*

A singular focus on enhancing patient care should be at the heart of any healthcare institution. Indeed, no healthcare organization would consider its focus to be anything but. Healthcare providers focus on the mission-critical requirements of patient care; payers and health agencies must contain costs while demonstrating service excellence. As in any industry, however, the day-to-day realities of running an organization mean that no institution is immune to errors or misjudgments. This focus on patient safety has come to the forefront of the industry, most prominently through the U.S. Institute of Medicine's (IOM) healthcare quality initiative, *Crossing the Quality Chasm*. Frequently cited in the industry – yet disconcerting nonetheless – is the IOM's estimate, first released in its 1999 *To Err is Human* report, that between 44,000-98,000 Americans die from medical errors annually. In fact, medical errors kill more people per year than breast cancer, AIDS, or motor vehicle accidents, according to the IOM, Centers for Disease Control and Prevention and National Center for Health Statistics. And the disturbing cost of human lives notwithstanding, there are financial ramifications as well: The IOM estimates that each year, medication-related errors for hospitalized patients cost roughly \$2 billion, and medical errors cost approximately \$37.6 billion, \$17 billion of which is associated with preventable errors. In this environment, healthcare organizations need to ensure that all parts of their operations – spanning clinical, business office, and IT functions – enable and support an organizational focus on delivering top-quality patient care.

### *Cost-effectively expanding access to healthcare services*

Although healthcare providers and payers face pressures that are unique to healthcare, they are not exempt from the top- and bottom-line pressures facing organizations in any industry. At the end of the day, the delivery and management of healthcare must make financial, as well as clinical, sense. Furthermore, demand for healthcare continues to increase. The aging of populations across the globe places unprecedented strains on existing healthcare systems. Consider these facts: according to the World Bank, the proportion of North American and European populations that is over the age of 65, or will reach 65 in the next 10 years, is increasing. The first of 76 million U.S. baby boomers will turn 65 in the next 10 years. And growth in the over-65 population in Europe is set to rise more sharply in the near future as life expectancy continues to increase and baby boomers reach retirement. Paired with near-stagnant population growth overall, an aging population places upward pressure on healthcare expenditure while reducing the pool of working people available to pay for it. As such, healthcare organizations of all types and sizes need to address the challenge of expansion, whether through broadening their scope of healthcare services or managed care products, improving the efficiency and productivity of services delivered, or expanding facilities to accommodate more patients.

### *Ensuring security and privacy of patient information*

Already highly regulated, healthcare organizations continue to focus on ensuring the security and privacy of patient information, especially in the U.S. to be compliant with Health Insurance Portability and Accountability Act (HIPAA) requirements. Although technology plays a role in helping institutions meet these compliance requirements – through identity and access management, for example – it is only one piece of a broader organizational focus on security and privacy. Indeed, providers and payers alike need to give full consideration to people, processes, and technology to adequately address these challenges. The burden that regulations such as HIPAA have placed on healthcare institutions is not insignificant: as an example, 57% of healthcare provider executives interviewed by Datamonitor in late 2005 cited “regulatory compliance requirements” as one of their top business and organizational challenges. As such, healthcare

institutions need to identify every point of vulnerability in their organizations – spanning infrastructure, people, and processes – and ensure that potential failure points are covered.

### *Need for increased collaboration and communication among healthcare organizations*

For the most part, the healthcare industry has developed from a localized model, with patients accustomed to visiting local hospitals and clinics. Today, however, patients are more typically 'shopping' for healthcare services, health insurance, wellness and disease information, in much the same way that they research major purchases. As patients become more savvy consumers of healthcare, institutions involved in the entire healthcare 'value chain' – from physician offices to insurance companies to regulatory agencies to pharmacies – need to communicate much more seamlessly than they have in the past. Not only a function of increasing consumer voice in the selection, delivery, and financing of healthcare, this need for increased collaboration and communication also is a function of the number of disparate organizations involved in the delivery and management of healthcare. As more countries take steps toward electronic health records (EHRs), the imperative for information sharing among healthcare organization only will increase.

### *Improve productivity and efficiency*

Effectively enhancing the quality of patient care often means helping healthcare professionals achieve greater productivity in their jobs – not only improving the efficiency of the organization as a whole but also contributing to greater satisfaction levels among healthcare professionals. For example, high-volume, time-consuming processes such as claims processing are frequent targets for squeezing out inefficiencies. And nurses should be able to focus the bulk of their attention on taking care of patients, not whether the network is down or whether they cannot access the clinical application from their desktops. In fact, improving staff productivity was noted as a top concern for 40% of healthcare executives surveyed by Datamonitor. As healthcare institutions continue to compete for talent – whether IT employees, physicians, nurses, or other clinicians – it will become increasingly important for providers and payers to continually focus on making the jobs of their employees or clinicians easier.

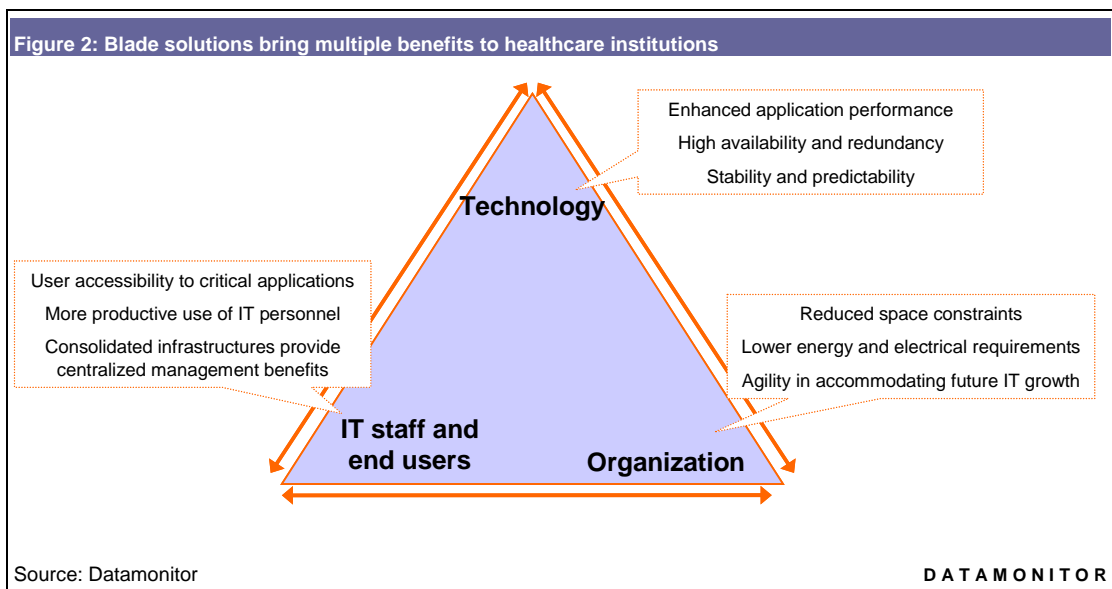
## ***Your IT infrastructure should enable and support you in addressing these challenges***

Healthcare institutions need to address not only the challenges they face today but also challenges unknown, ones that they may face tomorrow or in 10 years. In light of the ongoing challenges they face, healthcare institutions need to pay increasing attention to the role that IT can play in enabling and supporting the day-to-day operations of healthcare, whether it is facilitating physician access to medical records electronically or simply making the functioning of the network transparent to all staff members. And as IT comes more readily into the fold of how healthcare is delivered and managed, IT departments increasingly are called upon to ensure that the organization's IT infrastructure is agile enough to help the organization adapt and stay afloat in a changing environment. Exactly how a healthcare institution can achieve such agility remains challenging, but using blade solutions as part of a broader IT management strategy offers a compelling value proposition.

*What value can blade solutions bring to healthcare?*

While not new, blade solutions are receiving increased amounts of attention in healthcare. Though blade solutions traditionally are touted for their space-saving benefits, organizations that have invested in some form of blade solutions – in either server or PC configurations – typically have been able to realize benefits in other areas, such as reduced IT support costs and higher availability. In fact, the value that blade solutions can offer the healthcare industry includes a range of benefits that span technology benefits, organizational benefits, and benefits for IT staff and end users.

Blade solutions can provide benefits to IT departments and end users alike. As an example, the high availability and redundancy capabilities of blade solutions – hot swapping, for example – provide end users with more reliable access to critical applications and allow IT staff to keep these applications up and running while they fix a downed server. Instead of dispatching IT staff to a remote healthcare facility, for example, the IT department can fix the downed server from its central location. Less time must be spent in the field, providing for a more predictable level of IT support needs. In particular, healthcare organizations that have consolidated multiple facilities' servers onto a centralized location are apt to realize these benefits, as the centralized management of IT infrastructures can offer both cost and time savings for the organization. Healthcare organizations frequently face space constraints, which have implications for the cabling, electricity, and energy requirements in a traditional data center environment. Due to their size and design, blade solutions have lower energy and electrical requirements, features that lend well to organizations that need to prepare for future organizational and IT growth.



How can these benefits support healthcare institutions in achieving their organizational objectives? Consider how these various benefits can support some of the key challenges facing healthcare:

- **Enhancing the quality of patient care and reducing medical errors:** Traditional form factors present several logistical challenges for hospitals and other health institutions. In some hospital environments, for example, there are concerns about the heat generated from multiple servers in one room or germs that could be spread through the fans of desktop computers that are located in patient exam rooms or other sensitive areas. Using PC blade solutions provides hospitals with the option of locating CPUs separately from the essential items that an end user needs, such as the computer monitor, keyboard, and mouse. In addition to helping hospitals address physical and layout concerns, this approach also restricts end users in what they are able to do through the client system, reducing the possibility of them downloading sensitive patient information or leaving the system unsecured. At the end of the day, healthcare providers and payers need to ensure that their IT infrastructure completely supports the mission of enhancing the patient experience and the delivery of patient care. In addition, the high availability of applications delivered via blade solutions ensures that clinicians have reliable access to critical systems, such as computerized physician order entry (CPOE) systems, that play a role in preventing errors.
- **Cost-effectively expanding access to healthcare services:** In the context of global demographic shifts and generally aging populations placing strains on existing health systems, IT solutions need to be flexible in order to help healthcare organizations meet the changing (and usually increasing) demands for services. Vertically-oriented blade form factors provide payers and providers with greater flexibility and scalability. Servers from multiple facilities, for example, can be consolidated onto one server blade. And because a chassis can hold up to 16 half-height or 8 full-height blades, IT staff can add or swap blades on an ongoing basis as the needs of their organization change.
- **Ensuring security and privacy of patient information:** The central management of IT infrastructures, as is afforded by blade solutions, has benefits beyond those associated with improved use of IT human resources and greater control over end-user systems. As discussed above, the physical setup of PC blade solutions can be such that end users, such as nurses or physicians, have access only to the computer screen, keyboard, and mouse, with the CPU located in another room. Such setups help healthcare organizations minimize the potential for unauthorized access, intentional or unintentional, to sensitive patient information. Blade solutions can be an important enabler for healthcare institutions to maintain and document their compliance with requirements such as HIPAA in the U.S.
- **Need for increased collaboration and communication among healthcare organizations:** Blade solutions can play an important role in helping healthcare institutions digitize the delivery of patient care. The versatility of blades means that many types of applications can be run on blade form factors. With a consistent approach to application deployment, as can be achieved through a centrally managed IT infrastructure, healthcare institutions can deploy applications such as EHRs or electronic medical records (EMRs) that can be accessed by physicians (and consumers, in some cases) regardless of location – whether within the four walls of the institution or working remotely. As healthcare systems continue to move to more digitally-enabled workflows, having an IT infrastructure that enables reliable and secure access to patient medical records will be essential.

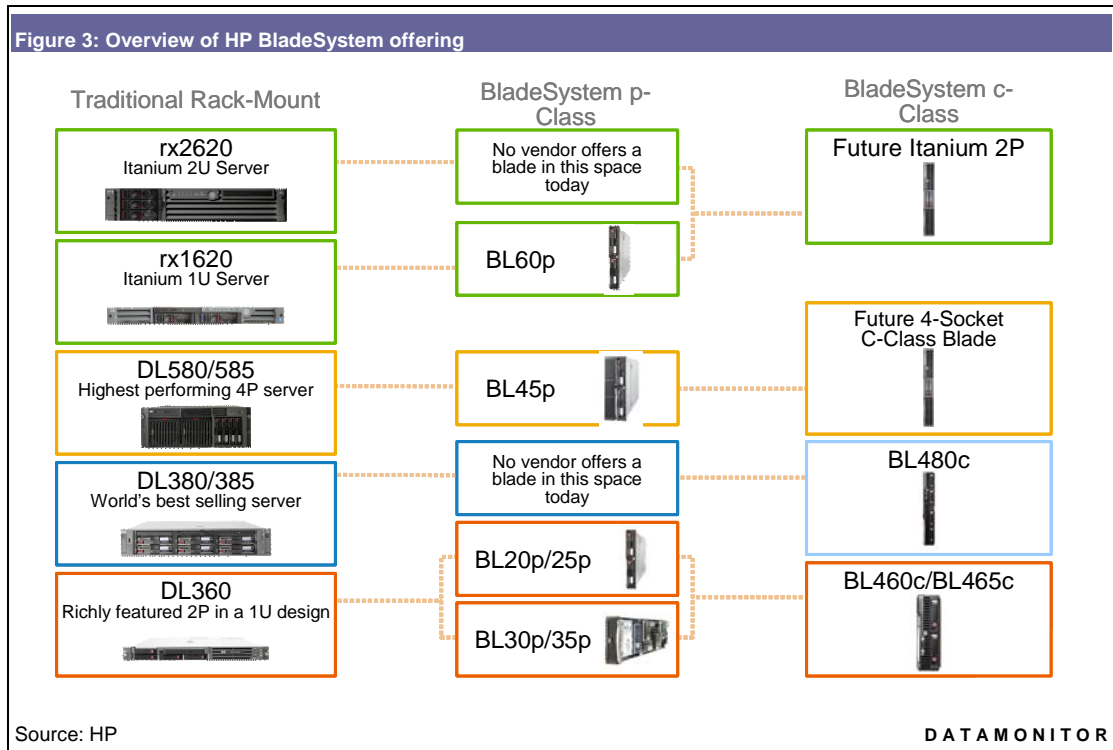
- Improve productivity and efficiency: Many IT departments have implemented blade solutions in order to provide their organizations with a more sustainable model for delivering and supporting services to end users. In fact, the high availability of applications delivered through blade solutions is one important benefit to healthcare organizations; having reliable access to critical clinical information systems, for example, keeps clinicians productive and able to focus on doing their jobs. In addition, healthcare is one industry that faces a shortage of IT personnel. As the demands for healthcare services continue to increase, healthcare providers and payers need to be able to scale with increased demand and support these services with fewer IT personnel. Because blade solutions allow for more centralized management of the IT infrastructure, organizations can rely on a fewer number of IT personnel to handle the day-to-day challenges of tasks such as upgrades, updates, move, or change requests.

### *Vendor offering example: HP BladeSystem*

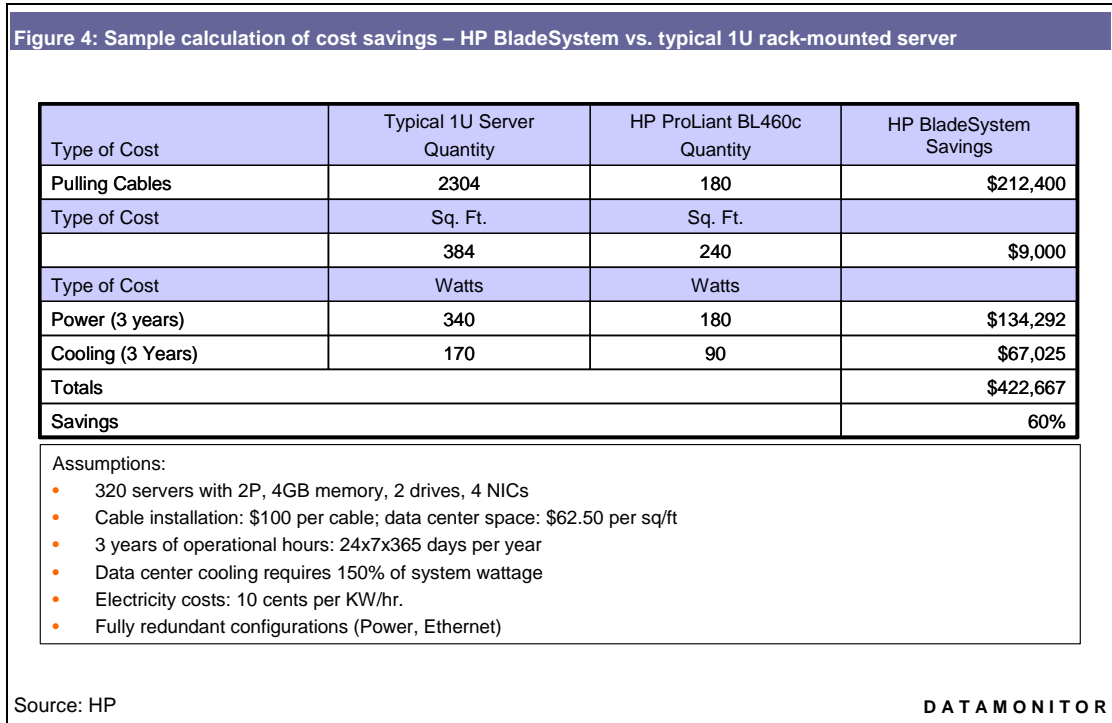
HP BladeSystem is an example of a vendor's blade solution offering that includes the full spectrum of hardware and software infrastructure, from server blades to management software, storage, and associated IT services. With its modular approach, the HP BladeSystem offering resonates with HP's Adaptive Infrastructure portfolio, which enables organizations to move from high-cost IT islands to low-cost shared IT assets. Figure 3 depicts the HP BladeSystem portfolio, based on a transition from traditional rack-mount to BladeSystem p-Class to c-Class blade solutions – the latter of which was just released by HP in June.

HP's BladeSystem c-Class portfolio offers customers significant blade technology improvements, particularly in the areas of virtualization, power and cooling, and system management capabilities. In addition, it is modular, allowing organizations to start with HP ProLiant and Integrity servers, HP StorageWorks storage offerings as well as client blades and then flexibly add applications and third-party products to expand their data centers as needed. Such flexibility is an important attribute since healthcare organizations can vary widely in size and scale. The blade technology improvements center on:

- Virtualization – through the HP Virtual Connect Architecture, which helps solve networking complexity challenges;
- Power and cooling – through HP Thermal Logic Technologies, which apply thermal controls to turn high density into a power and cooling advantage without compromising processing performance; and
- System management – through HP Insight Control Management, which unifies and automates management of physical and virtual servers, storage, networking and power and cooling through a single console; and HP Onboard Administrator, which integrates consumer-designed technology from HP's Imaging and Printing Group to provide an easy-to-use system management interface.



By achieving the transition from high-cost IT islands to low-cost shared IT assets, organizations are able to provide higher quality and availability of service and become more nimble in responding to changes in their IT infrastructure. And cost savings – especially as related to IT operations and management – go hand in hand with such efficiencies. In evaluating the potential cost savings that blade solutions can provide, organizations need to consider both the upfront, capital expenditures as well as ongoing, operational costs. Capital expenditures will include items such as servers, storage, and infrastructure management software, whereas operational costs are those associated with supporting and maintaining the data center infrastructure. Organizations are likely to see the benefits of blade solutions most noticeably in the reduced operational costs associated with simplified IT infrastructures and IT management processes, as compared to those associated with a traditional rack-mount infrastructure. As an example, when comparing the capital and operational costs of a HP BladeSystem in comparison to a typical 1U rack-mounted server, HP found that there is roughly a 60% savings in operational expenses, based on savings in categories such as number of actual servers needed, cable installation, square footage requirements, power and cooling costs for the data center.



IT services form an important component of HP’s BladeSystem offering and value proposition. Through its 65,000-strong global network of IT professionals, HP works with its customers to navigate the numerous healthcare offerings available. Based on customers’ business problems and requirements, HP Services formulates a single-source approach that incorporates a mix of healthcare systems and technology partners, hardware and software products. Through this approach, HP offers end-to-end services, with a single point of ownership and accountability, for solution planning and financing; architecture design consulting and implementation; startup and installation, hardware, software and network integration; and ongoing management and support. HP has worked with healthcare organizations to improve their return on investment, by building on legacy IT systems, installing new healthcare or case management information systems, or outfitting mobile case workers and medical teams.

Healthcare organizations can take advantage of HP Services’ offerings that address four key areas of concern:

- **Change** - Understanding and countering business risks associated with change is imperative. HP delivers a wide range of services to assess, manage, and mitigate risk exposure, such as: application and data migration support; program, project, and service management; ITSM consultancy; IT consolidation; investment justification; education and training.
- **Time** - Issues such as resource constraints, lack of expertise, or conflicting IT and business priorities can stand in the way of rapid BladeSystem implementation and lengthen time-to-results. HP Services offers BladeSystem-specific expertise in areas including solution design, IT capacity planning, and installation and startup support. HP is also able to deliver complete factory-configured, factory-integrated BladeSystem solutions.

- Cost – HP has developed its own total cost of ownership (TCO) assessment tools and offers a range of service options to deliver the most cost-effective support solutions for customers' specific needs: comprehensive, rapid-response hardware and software support; automated remote support and management solutions; reactive and proactive mission-critical support; and financial services to help with BladeSystem planning and budgeting.
- Energy - As high-density equipment proliferates in the datacenter, the need for effective power and cooling strategies intensifies. HP datacenter environment services — including facility assessment, thermal assessment, and site planning — can help healthcare organizations save energy and contain costs.

### ***Blade solutions in action: Customer case examples***

#### *Golden Ventures: Realizing the benefits of a centralized IT environment*

A leading provider of administrative services to long-term care companies, Golden Ventures serves nursing home clients that have 34,000 employees and several hundred facilities in the U.S., including 342 skilled nursing facilities, 18 assisted living centers, and 68 hospice and home care centers. Like other organizations delivering healthcare services, Golden Ventures and its clients face challenges in not only ensuring the health and well-being of nursing home residents, but also in helping employees in its facilities do their jobs more effectively — all while enabling a comprehensive view of operations from its headquarters in Fort Smith, Arkansas.

#### *Objective: Ensure sustainability and predictability of IT operations by consolidating its IT environment*

In 2002, Golden Ventures found itself in a predicament: its distributed IT environment had contributed to “islands of isolation” among nursing homes that made it difficult for the company to get a quick read on how the organization was performing. In this distributed environment, applications were running on a client-server architecture. And each facility had limited connectivity to the Golden Ventures headquarters. With a limited number of remote field personnel that were able to ‘float’ among the facilities to provide ongoing IT support, Golden Ventures would not have been able to sustain this distributed environment over the long term. Thus began the company’s process of looking into alternatives.

Golden Ventures’ objective in this decision process was to find a way to collapse its distributed IT environment into a centralized environment, one that the company could maintain efficiently, with some level of predictability and repeatability. Given the specifics of Golden Ventures’ situation — consolidating more than 600 servers into a single, existing data center located at corporate headquarters — there were few technology options available that would not require the company to invest in building out additional data center space. Golden Ventures knew that blade server solutions, specifically vertical form factors, would help them achieve their IT objectives while minimizing space requirements. After considering the various technology form factors available at the time, Golden Ventures decided that blade server solutions could best live in its ‘data center footprint.’ In terms of space, cable management, and electrical management, the company would not have been able to achieve its IT consolidation objectives through standard server devices. Based on a combination of a strong existing relationship with HP and trust in its blade server devices, Golden Ventures decided to go with HP’s blade solutions.

As one of HP’s early blade server customers, Golden Ventures first did a 3-month pilot project with a single enclosure and 8 servers. This pilot project gave the IT department an opportunity to get used to the technology itself as well as managing the blade servers. Running parallel was the company’s migration of its 7,000+ PCs into a Citrix thin client environment. Following the initial pilot project, the company completed its full rollout of the blade solution in the span of 2 months.

### Results: Successful IT consolidation results in benefits across the organization

From its investment in blade solutions, Golden Ventures has realized several types of benefits across the organization. Most importantly, the company was able to achieve its original objective of consolidating 600 servers into its existing data center. With blade servers, it was able to put more than one facility on a single blade device. On an ongoing basis, perhaps most visible of these benefits has been the simplified IT management and support process. Compared to the requirements of its former client-server environment in terms of sheer time and human resources — for upgrades, patches, fixes, and other support — the centralized IT environment using blade solutions has offered benefits in terms of time savings, cost savings, and improved employee satisfaction.

- **More efficient IT support:** The client-server environment posed a number of challenges related to both key application performance as well as the management of the IT infrastructure. Although Golden Ventures ran into some challenges related to the performance of some of its key clinical applications in the client-server environment, the bigger challenge that the company faced was in terms of time and human resources needed to support multiple facilities. When a server was down, for example, the time required to ship the server to a remote location to get it back up and running typically was 3 days from start to finish. With its centralized IT environment, this window shrinks dramatically, to about 1 hour for getting the server back up and running.
- **More efficient use of IT human resources:** Golden Ventures was able to streamline its IT department significantly. Currently, Golden Ventures is able to support its blade solutions through the efforts of 5 staff out of its total of 100 IT employees, including approximately 20 field staff. While the proportion of field staff to IT staff remained fairly constant, Golden Ventures was able to reduce its total number of IT employees, partly as a result of the reduced demands on the department for providing on-site IT support.
- **Improved IT employee satisfaction:** IT staff formerly involved in providing IT support services in the field, traveling around to the residential facilities, now are able to focus more of their field efforts on providing training, such as training on business process modeling, and less time on the more mundane 'break — fix' type of work. While these field staff still makes rounds to the various facilities regularly, the upside is that their roles have shifted in line with the reduced demands for high volumes of on-site IT support.
- **Improved end-user satisfaction:** Managers and senior management can run reports quickly. Before, this process could take several hours. Running applications, including clinical applications and business office applications (such as those involved in tracking patient health and facility task management) off the server blades provides for faster and improved application performance. This capability is particularly important for Golden Ventures since documentation and reporting is so important in the long-term care business and for meeting Medicare and Medicaid requirements.
- **Better visibility into overall IT operations:** Golden Ventures is now better able to continually monitor the status of its overall IT operations. For example, automatic alerts of 'vital signs' are pushed out to IT managers. In addition, proactive reporting from the applications, such as Citrix and Microsoft, enable the IT team to always be aware of the general health of the IT infrastructure, enabling it to operate the infrastructure with fewer staff.

### Advice for other healthcare institutions

Golden Ventures cites the improved agility and flexibility of its IT operations as a key overarching benefit that it has experienced. The tangible and intangible benefits to the organization are not small: Golden Ventures estimates that it has

seen a return on investment (ROI) of \$6 million. Offering its advice to other long-term care or other healthcare institutions, particularly those relying on a highly distributed, client-server environment, Golden Ventures notes that anytime an organization collapses and consolidates infrastructures, there are going to be challenges. Specific to the implementation of blade solutions, organizations need to be thoughtful about their HVAC requirements and data center cooling practices. And as the latest blade solutions, such as HP's C-class solutions, offer significant technology improvements, organizations should take advantage of these improvements in terms of storage and performance to consolidate their infrastructures even further. Finally, the success of blade solutions depends on everything from the technology to the physical layout of the data center. Even seemingly small details such as which directions the blades face — along with bigger issues such as power requirements and data center cooling practices — are an integral part of the decision-making and implementation process.

### *Capital Region Orthopaedic Group: Reaping the benefits of a single-vendor strategy*

Based in Albany, New York, Capital Region Orthopaedic Group (CROG) is a 23-physician practice that provides care for a variety of musculoskeletal problems. Across 5 locations, its members handle nearly 100,000 office visits each year and upwards of 8,000 surgical cases, 5,800 of which are performed at the Ambulatory Surgery Center. As a physician practice, CROG needs to be constantly vigilant about how its IT infrastructure can best serve its stakeholders — physicians, employees, and patients — as well as accommodate the organization's future growth.

### *Objective: A highly available solution to provide users with high levels of service*

About 5 years ago, CROG developed its Bone and Joint Center, positioning it for future growth in its IT infrastructure. It was the process of evaluating vendor packages for its Picture Archiving and Communication Systems (PACS) implementation — migrating from film-based X-rays to digital ones — that triggered CROG's decision to pursue a blade solution. Yet it was not the blades themselves that drove the group's decision. Rather, it was the group's objectives and goals that drove the decision: it was looking for a highly available solution that would provide its users with high levels of service. And it wanted to avoid the headache of managing multiple support relationships with several hardware vendors.

After receiving bids from several application vendors for its PACS implementation, CROG found itself overwhelmed by the prospect of managing so many hardware vendor relationships just to support its critical applications. As such, CROG looked for a vendor that would take on the responsibility of supporting its entire IT hardware infrastructure. The group was concerned not only about the headaches associated with managing multiple vendor support relationships; it also was concerned that such an approach would not readily scale to meet its future IT needs. In the end, HP was the vendor that CROG selected to manage its entire IT hardware infrastructure. Beyond the ability to support the entire IT hardware infrastructure, it was the presence of a local HP office and HP's commitment to provide high levels of support that cinched the decision for CROG. Assuming this responsibility required HP to work closely with several application vendors on their hardware specifications.

The timeframe from beginning the selection and purchasing process to beginning the installation was about 4 months; actual deployment took only 30 days. During the timeframe prior to deploying the blades, CROG also was converting its application data, in its practice management system, to prepare for the migration. CROG has taken advantage of a 3-year support service contract with HP, which relieves some of the support burden from its 4 IT staff members.

### Results: Improved physician, employee satisfaction and scalable IT infrastructure

- High availability, improved user satisfaction: Perhaps the most important benefit that CROG has realized from its investment has been that blade solutions have provided for a highly available IT environment. Particularly beneficial have been the redundancy features – hot swappable, rapid deployment. A failed blade server can automatically switch over to another blade server to keep service uninterrupted while the failed server is restored. This highly available environment has helped the IT department keep the IT infrastructure as transparent as possible to users, such that users do not even know when a server has gone down. This type of transparency has been invaluable in providing stable, robust service to the physicians, nurses, and staff.
- Scalable IT infrastructure: With multiple chassis, CROG has the flexibility to add and swap out blades as necessary. Important to ensuring full redundancy, this flexibility also is important as the organization's IT needs increase (which is particularly relevant for healthcare institutions dealing with digital images, many of which are growing in size as medical imaging technologies become more complex). Having found the blades very versatile, CROG now purchases blades for whatever applications it can.
- Improved application performance: Physicians have commented that the performance of the system is excellent, citing a noticeable improvement in speed with the blade servers. In combination with the blade server, centralized storage has also contributed to this performance, as it allows for dynamic adjustment of storage, which enables a very stable environment.
- From a technical standpoint, CROG found that it is particularly important for organizations not to ignore the networking interconnections with the blade servers, as these are critical to the success of the blade solution. In many cases, this may require the healthcare organization to upgrade its networking switch. Institutions have several options when it comes to how blades are installed.

### Advice for other healthcare institutions

CROG has no regrets about the single-vendor strategy that it has employed and has been especially pleased with the level of service that it receives from HP. In addition, it is a strong advocate for the multiple-server architecture and strategy that it pursued in partnership with HP. Its advice for other physician practices that find themselves in a situation similar to its own centers on the assurance that pursuing a multiple-server strategy brings to the organization: by running applications on multiple servers that continually update each other, CROG has been able to ensure a high level of system availability. At the end of the day, it is the ability to make the intricacies of the IT infrastructure transparent to the physicians and employees of the practice that delivers tangible value to the physician practice.

***One size may not fit all: Deciding whether blade solutions are right for your organization***

Blade solutions are especially compelling for the healthcare industry because of the benefits that they bring to healthcare institutions: helping providers and payers streamline their IT support, reduce costs, and use valuable space more effectively. In fact, there are varying scenarios in which healthcare organizations can maximize the benefits and value of blade solutions. For example, many healthcare institutions are interested in consolidating multiple servers onto a single platform. While the motivations for IT consolidation will vary, in most cases, healthcare organizations are keen to consolidate in order to minimize the costs of working with multiple technology vendors and platforms. Another consideration that many healthcare organizations have is the need to respond to growing demands on the IT infrastructure within existing space and facilities constraints. Large, multi-site hospitals, integrated delivery networks (IDNs) or payer organizations that have a widely distributed desktop computing environment are likely to face this challenge. With the costs of PC management in such a distributed environment typically being very high, coupled with the need to adopt stringent access policies to ensure security, blade solutions can offer an infrastructure in which desktop resources can be centralized into a data center.

At the same time, every healthcare organization is unique. And deciding whether blade solutions are the right avenue for your organization to pursue should be a process that is tailored to the unique requirements of your organization. What types of healthcare institutions may benefit most from blade solutions? In general, organizations that have the following characteristics are likely to derive the most value from blade solutions.

- Require highly available systems – the automatic switchover and redundancy capabilities of blade solutions help healthcare organizations, from large health networks to physician's offices to payer organizations, provide higher and more reliable levels of service to end users, such as physicians, nurses, other clinicians, and staff members.
- Anticipate operational growth – their versatility and scalability make blade solutions a good match for healthcare organizations that need to not only meet short-term operational IT objectives but also position the organization for further growth.
- Have specific security concerns and needs – centralized management allows healthcare organizations to provide for greater security of both end-user computer systems as well as access to protected health information in the hospital and physician office environment. This type of centralized management is particularly well-suited for organizations that have a diverse set of end users, typically with varying levels of IT sophistication, because they can set access policies to ensure the highest levels of security of computer systems and protected health information.
- Need to streamline IT support processes – this need is especially relevant for healthcare organizations that find themselves needing to deliver more services and support a larger end-user base, including physicians, nurses, staff, and other end users, with a static (or even smaller) team of IT personnel. Through consolidation and centralized management of blade solutions, IT departments (especially those within hospitals with multiple campuses or geographically disperse physicians' offices) can support a larger base of end users because requests such as moves, adds, and changes can be done centrally.