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The Business Value of Large-Scale Server Consolidation

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EXECUTIVE SUMMARY

This paper examines the results of an IDC study of enterprise organizations that have deployed IBM Power Systems to achieve workload consolidation, improved uptime, and reduced operational costs. These systems are highly virtualized platforms that supported consolidation of workloads and provided near-term payback from the initial investment.

The respondents to the study provided data on both the investments required — acquiring and deploying the Power Systems and migrating the software and application workloads — and the business returns, including reduced IT labor, reduced downtime, and support for increasing demand for computing.

Given budget constraints, rising energy costs, and continuing concerns about the economic downturn that began in fall 2008, efficiency in the datacenter is a top priority for businesses today. To become more efficient, IT organizations have focused on workload consolidation, reducing the number of individual servers that must be managed and maintained. Virtualization is the key to this workload consolidation because it assigns workloads, running on virtual servers, to physical server resources, such as processor cores, memory, and I/O links. Further, virtualization isolates workloads, preventing them from interfering with one another and avoiding downtime.

Key findings from this study of Power Systems deployed in large organizations included system downtime reductions of 60% to 94%; reduction in IT staff time related to maintenance of up to 50%; and an average annual savings of more than $235,000 per 1,000 users for the sites that had deployed POWER6 servers. Other sources of savings included avoidance of frequent hardware purchases and power/cooling cost reductions. One customer reported saving 88% in power costs, amounting to $3.5 million annually. For large enterprises with more than 10,000 end users, the savings for these deployments added up to millions of dollars over a three-year period, as the tables in this document show.

These results, regarding POWER6 system deployments, will likely be amplified by the introduction of a new generation of IBM servers that are based on POWER7 processors, which were designed to be faster — with up to four times the number of cores per processor — and more energy efficient.

SITUATION OVERVIEW

Enterprises are being pressed to deal with continuously increasing demand for processing applications and to work with hard limits to power, cooling, and space growth in their datacenters. Clearly, this is not an easy time to be an IT manager or a business manager

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who wants to leverage technology to make the business more efficient while reducing operational costs. All of this is happening in the context of a deployment of large numbers of servers, including rack-optimized servers and blade servers, since the mid-2000s.

The demands for increased computing capabilities are colliding with real-world pressures associated with the costs of both acquiring more servers to meet the demands and operating those servers over time. Power and cooling costs have placed limits on buildouts for new datacenters, and maintenance costs must be kept in check. In addition, linear staffing and software costs are contributing to the critical review of driving improved operational efficiency in the datacenter.

Datacenter Priorities

In recent years, IT organizations have seen the impact of a rapidly growing population of servers installed in their sites. The sheer magnitude of the server populations supported worldwide is staggering: more than 35 million units today compared with just 5 million units worldwide in 1996. The main driver for this growth was high sales of volume servers — servers priced less than $25,000 each — that appeared in a marketplace that was looking to reduce capital expenditures on a per-server basis, as the Internet boom began in 1999 and extending through the dot-com bubble and into the 2000s. As can be seen in Figure 1, the worldwide installed base of servers is more than 35 million units, outstripped by the total number of logical servers (also known as virtual servers or virtual machines [VMs]). While enabling additional capacity for new workloads, this rapid growth of virtual servers provides new management challenges for IT staff.

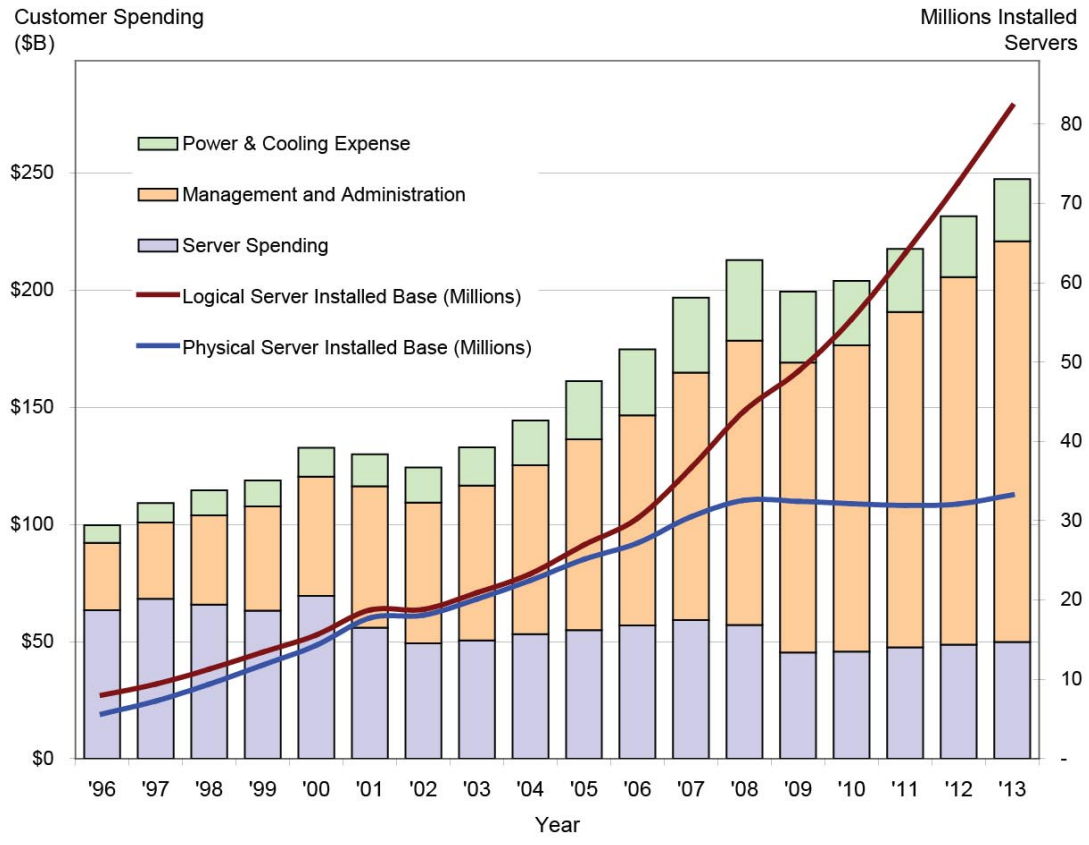
At the datacenter level, the proliferation of small servers has introduced a set of pressing agenda items for IT staffers to address: managing large numbers of servers; maintaining all of the servers at the proper software release levels for operating systems, middleware, system management software, and applications; ensuring adequate power and cooling to keep all of the servers in optimal operating condition; maintaining and troubleshooting the vast and complex networks that connect the servers; and managing consistent security policies across all of the servers. Often, of course, that is not the case — and IT staffers must scramble to repair, maintain, or replace servers, all of which drives up operational costs. Often, many of the servers are underutilized because the datacenter has acquired enough of them to meet peak processing requirements.

This has led to a situation in which IT organizations are looking to consolidate workloads, to reduce the total number of server "footprints" under management, and to reduce IT staff time and power/cooling costs at the same time. Many have looked to virtualization to help with workload consolidation, as server resources can be carved into multiple virtual servers, or virtual machines. In this way, one physical server can now support the workloads that used to run in many separate physical servers. The concept is one of sharing resources so that unused capacity is made available to workloads that need it, and this can be done dynamically and without user intervention.

Others have looked to IT technologies that support efficiency — such as provisioning software, workload management software, and system management software — to improve the management of dozens, or hundreds, of systems within a single datacenter. Other considerations are reduction in downtime through the use of sophisticated hardware reliability features and high-availability software as well as disaster recovery software, along with replication software that copies production data for later use. Indeed, the ability to move workloads to alternate locations and the ability to access production data, together, support disaster recovery in case of outages and hardware failures — all of which supports business continuity for users and customers.

FIGURE 1

Worldwide IT Spending on Servers, Power and Cooling, and Management/Administration, 1996–2013



Source: IDC, 2010

Operating a Datacenter: The Real Costs

IT views about operating costs vary somewhat by size of organization. For example, downtime in systems that are accessed by 20,000 users, or 50,000+ users, will have a greater dollar value, on an absolute basis, than downtime in systems that support companies with 1,000 or fewer users. However, the impact of downtime, even at small and medium-sized businesses, is just as great. An hour or more of unplanned downtime is likely a showstopper, which impacts customer loyalty as well as revenue lost to the business.

This study examined the business value of systems in a number of large enterprises and then normalized the results per 1,000 users so that readers can relate the findings to their own organization and their own datacenter deployment. Therefore, this study compiled all costs and all savings from workload consolidation and then divided those data points by the total number of users within the organizations that were studied.

Following are some of the top categories that IDC studied in the customers' companies:

- **IT staff costs.** Server deployments require support of a "server life cycle," beginning with provisioning of a physical server, deployment within the infrastructure, management of that server, and ongoing maintenance — including the updates of software for the operating system and security updates. All of these actions require some type of action on the part of IT staffers, with the burden falling most heavily on system administrators.

- **Maintenance.** Technologies that make these administrators more productive, including automation software that removes labor-intensive manual processes, help to reduce IT staff costs. Without automation, many maintenance processes are labor intensive and require in-person visits to the servers being maintained. When working with dedicated servers — servers that run one workload — defining the capacity for each physical server becomes critical. Additional physical servers are often on standby, awaiting new workloads or peak processing times, making capacity planning more difficult.

- **Event and incident response.** IT staff must identify and prioritize server infrastructure events such as performance degradation, interrupts, and component failures and establish the appropriate response to those events, especially responding to conditions that could lead to user downtime exceptions. Doing so involves logging, monitoring, and tracking for all "components" involved in the provision of uptime. Effective problem management further involves establishing the underlying causes of an incident and their subsequent resolution and prevention. This task increases with the number of physical servers.

- **Management.** Managing virtual servers, and allocating resources to virtual servers, is another mechanism for reducing IT staff costs, as long as administrators can view all managed objects (physical and virtual) in an efficient way. Virtual machines can be provisioned easier, and faster, than physical servers. This reduces the task of adding cabling to connect the new server and

allows the system to add resources to or subtract resources from the virtual machine "pool" as needed, when needed. This happens without physically changing physical components on each standalone server. The challenge is having virtualization software that can scale individual VMs enough to handle rapidly growing applications and that can manage to policies, or priorities, that promote IT efficiency.

- **Power.** Many localities, including large cities around the world, are finding the practical limits to providing energy to growing datacenters. In some cases, large IT organizations have started adding capacity near sources of low-cost energy, such as near hydroelectric power sources, or in remote states that have lower energy costs. Another approach is to "govern" the power used by each server by throttling energy use up or down as processing demand requires — and by turning off processors that are not needed to support the running workloads. A variety of technologies can be used to accomplish this goal, but the requirement remains the same: to get the most performance per watt per server.

- **Cooling.** Likewise, cooling is a very big priority in today's datacenters. There are a number of ways of addressing this issue. One way is to address the heat generation through use of energy-efficient components and improved air-cooling designs that minimize heat "pockets" within the server and drive warm air out of the server cabinet or chassis. Water cooling of large-scale and bladed systems is also making a comeback, with cooling units built into the backplanes of server cabinets. Importantly, there is the approach of redesigning the datacenter itself to reduce overheating within the "aisles" of the datacenter. This has led to hot aisle/cold aisle blueprints for datacenters and analysis of server placements within the datacenter that prevents warm air from overheating sections of the datacenter.

- **Space.** It is getting more difficult to expand current datacenters — or to build a new datacenter. A lack of available datacenter "real estate" or an inexpensive supply of electrical power can make discussions about new datacenter buildouts a non-starter. IT organizations and facilities managers have just a few options: leasing additional datacenter facilities, building new datacenter facilities, or making better use of the square footage within datacenters that are already in place.

The Economic Impact of Consolidation

Consolidation of workloads within the datacenter reduces the number of server "footprints" that must be maintained or managed. Virtualization with dynamically shared resources dramatically reduces many of the datacenter costs listed previously, including labor, software, hardware, power, cooling, and space). When IT staffers can run the same number or an increased number of workloads on the same number of or fewer server systems, then their productivity is increased, and many operational costs are reduced.

Server consolidation is now gaining traction in the x86 server space, leveraging virtualization designed for use with x86 systems. But the benefits of consolidation increase with scale. For example, reducing the number of physical servers from 200 to 100 may be beneficial, but reducing that number from 200 to 5 is even more

beneficial. That means that scalable servers are well-suited for consolidating many hundreds of VMs onto a single system. By consolidating workloads onto highly scalable servers so that these workloads may inherit the reliability, availability, and serviceability characteristics of technologies that have evolved over decades of use.

Following the process of platform migration, IT operations can become more efficient when volume server workloads are consolidated onto larger systems for production. The IDC Research on the Business Value of Large-Scale Consolidation section of this document describes how enterprises can measure this in the form of reduced operational costs and improved IT staff productivity on a per-user basis over a period of use (typically three to five years). Given the range and size of benefits, the payback period of the initial investment was relatively short — usually less than one year, as the following IDC study data for Power Systems deployments in large user sites demonstrates.

IBM POWER SYSTEMS SOLUTIONS

One server platform that leverages advanced virtualization capabilities is the IBM Power Systems family. These systems typically run business processing workloads, such as transactional workloads, ERP and CRM, and analytics, that sift through large data stores to find patterns in the data. They can also run horizontal workloads (e.g., collaborative/email workloads, Web infrastructure workloads, and IT infrastructure workloads) and a wide variety of packaged applications across a number of vertical markets: financial services, retail, manufacturing, government, and healthcare.

The Power Systems product line ranges from entry-level volume servers (volume servers are defined by IDC as servers priced less than $25,000) to midrange servers (servers priced from $25,000 to $249,999) and scales up to high-end servers (servers priced at $250,000 or more).

IBM has been shipping Power Systems servers since 2000, offering hardware features for reliability, advanced virtualization for highly granular control of workloads, and the ability to manage workloads so that they are directed to available resources. Power Systems are based on POWER processors, which are the basis of system-level building blocks for enterprise computing, including high-performance computing (HPC) used for data analysis and simulation software.

In 2010, IBM began to refresh the technology in the Power Systems line with POWER7 technology, which IBM designs and manufactures. IBM continues to drive a road map based on Power Architecture, which today provides up to 8 cores per POWER7 processor, depending on configuration and Power Systems model. These energy-efficient server products provide more processing power per server "footprint" than ever before.

IBM's Power Architecture is the foundation for the IBM Power Systems portfolio, which achieved a number 1 ranking in terms of factory revenue in the worldwide Unix server market in 2007, 2008, and 2009. The company, which had been ranked number 3 through the early 2000s, has made a concerted effort in recent years to invest in new technologies, such as the POWER processors, PowerVM virtualization software, and AIX, IBM's flagship Unix operating system.

Now, IBM is rolling out an entire line of servers based on POWER7 processors. This process began in early 2010 and is expected to continue through this month so that by September the entire Power Systems commercial product line will have been refreshed with POWER7 processors. The new processors bring faster performance, dramatically improved performance per watt, and up to 8 cores per POWER7 multi-core processor. POWER7 supports more scalable, highly virtualized systems, with granularity down to 1/10 of one processor devoted to a single workload — and the ability to scale up to a total of 256 cores in a single server.

Virtualization Enables Consolidation

IBM Power Systems servers have built-in virtualization capabilities, through the built-in IBM PowerVM hypervisor technology. They can be highly virtualized, with up to 10 micropartitions per POWER processor. Within the partitions, customers have the option to run one of three operating systems: IBM AIX Unix, Linux (Red Hat Enterprise Linux or Novell SUSE Linux), and IBM i (which is the follow-on product to i5/OS or OS/400 for IBM System i servers). By isolating combinations of various workloads within partitions, PowerVM supports workload consolidation on a Power Systems server.

Consolidation of workloads leverages these virtualization capabilities, allowing even large-scale workloads to reside side by side, sharing processor resources while isolated in different partitions. Finally, advanced on-board system management software assigns hardware resources to workloads — dynamically reallocating these resources as processing requirements change and as business needs change over time.

POWER7 Processors Improve Performance

All of the POWER6 processor-based models studied and reported on in this paper provide workload-sensitive resource allocation, meaning that resources can be automatically increased or decreased by workload, via policy-based automation software, as workload and business needs dictate.

The findings described in this document would be amplified through the use of POWER7 technology, which provides 40–50% greater performance per core than POWER6 technology, while requiring up to 70% less energy. More information about the POWER7 processors and the Power Systems server models based on these processors can be found on the IBM corporate Web site (www.ibm.com).

For example, the Intelligent Threads and Intelligent Cache features of POWER7 can assign more threads to a specific workload, or allocate more cache to cores, if the workloads that are running require it. In addition, Intelligent Energy Optimization shuts down cores that are not needed, to reduce the amount of heat being dissipated, and then restores those cores when processing demands require them.

The use of multi-core processors has been a game changer across the computer industry. Compared with single-core and dual-core designs, multi-core designs reduce heat dissipation while adding densely packed computing capacity to each new processor. The combination of virtualization software with multi-core processors

supports higher degrees of virtualization of computing resources, allowing more workloads to run on fewer server footprints than in earlier generations of servers. POWER7 processors ship in 4-core, 6-core and 8-core versions, and each core supports 4 threads, meaning that 8-core processors will support 32 threads. These processors support IBM AIX Unix, enterprise Linux distributions (Novell SUSE Linux and Red Hat Enterprise Linux), and the IBM i operating system.

IDC RESEARCH ON THE BUSINESS VALUE OF LARGE-SCALE CONSOLIDATION

IDC conducted this study in 2010 to determine the business value experienced by customers consolidating on Power servers. The study reviewed the experiences at six sites, referred by IBM, that consolidated disparate server workloads on Power servers based on POWER6 processors.

The study respondents provided this data as part of an IDC business value survey measuring the costs associated with deployment of new systems and the operational results, such as reductions in IT operating costs, costs related to system downtime, and employee productivity improvements associated with those deployments.

Research Method

IDC conducted interviews with the six organizations, each of which managed a unique inventory and mix of server platforms. These companies ranged in size from 1,500 to 175,000 employees; hailed from the United States, Western Europe, and Central Europe; and represented the retail, financial services, manufacturing, and energy verticals. Most of these organizations were large companies whose server infrastructure supported tens of thousands of intra-enterprise end users and an even larger number of extra-enterprise users, including end customers, accessing their enterprise systems. Each of these organizations deployed IBM Power Systems for consolidation and used them over a period of three years or more. IDC also noted other types of systems that were co-deployed in the same datacenter with the Power Systems servers.

The interviews yielded information defining up-front investment costs in the technology, as well as deployment and ongoing maintenance costs. The interviews also elicited the companies' experiences with tangible and measurable IT and end-user business benefits over a three-year period. IDC's Business Value team combined all of these factors in the synthesis of an overall return on investment (ROI) calculation.

Importantly, the benefits of consolidation on IBM Power Systems — increased productivity for IT and employees, reduced operational costs (opex) (e.g., reduced downtime) — resulted in a rapid return on the up-front investment. The summary data tables in this document present the key findings, enumerating information about the costs to deploy consolidation platforms and the business benefits that resulted. In many cases, the consolidation of workloads from smaller distributed servers and re-hosting on the Power Systems resulted in efficiencies related to IT staff time, avoidance of downtime, and reduced ongoing maintenance costs.

Key Findings

When considering the effects of consolidating on Power Systems for three years of use, IDC found the following key benefits regarding Power Systems deployments:

- The total number of processors within servers under management was reduced by up to 90% compared with the total before workload consolidation. Companies were able to reduce their server hardware and software costs (capex) by $13,560 per 1,000 users.
- By consolidating on a more efficient platform, companies estimated that they were annually saving $111,900 per 1,000 users in avoided increases in hardware, software, and infrastructure (capex) spending and another $10,420 per 1,000 users in additional staffing.
- Systems consolidation on the more efficient power series reduced annual energy costs by $63,200 per 1,000 users.
- Productivity related to server and operating systems costs improved, reducing by 50% the time spent by IT staff in supporting the server environment.
- Productivity related to tuning, customization, and ongoing management of servers improved, reducing time spent on these tasks by 50%.
- System downtime was reduced 60% to 94%. In the words of one CIO, "...We went from entry level, which a lot of this was on, to basically a 10-year mean time between failure [MTBF] on most of the hardware components..."
- Annual benefits totaled $235,250 per 1,000 users (see Table 1).
- ROI analysis showed payback within eight months of the initial acquisition of the server.

TABLE 1

Average Annual Savings per 1,000 Users for Consolidating Servers

Category	Savings	Amount
Fewer servers	Server consolidation	$13,560
	Energy savings	$63,200
	IT labor avoided	$10,420
Accommodate workload	Hardware avoidance	$80,120
	Facilities and infrastructure avoidance	$31,780
Less downtime	IT productivity	$4,590
	User productivity	$31,580
Total		$235,250

Source: IDC's Business Value Research, 2010

Benefit calculations applied the following key assumptions and rules:

- To quantify the monetary value of staff efficiency and user productivity savings reported in time values (hours, months, etc.), we multiply the time value by the prorated portion of the burdened salary.
- Less downtime translates to better user productivity and less IT help desk and support recovery time (IT productivity). To calculate user productivity savings, we multiply the reduction in downtime hours by the number of users affected and their hourly rate (burdened salary).
- Because not every hour of downtime equates to a lost hour of productivity, IDC specifically asks about the percentage impact of an hour of downtime and attributes a fraction of the hourly result to the productivity savings.

Contributors to Cost

Chief contributors to cost include IT staff time that is devoted to maintenance, the total cost of downtime to the organization, and a long list of ongoing maintenance costs. All of these contributors to cost were considered when calculating operational costs. These factors can contribute to operational expenses, even as they impact the ability of end users, end customers, and business partners to make use of the IT servers they have installed.

Cost Savings

Companies in the study experienced cost savings in a number of categories, including hardware reduction and refresh avoidance; licensing fee reduction; and avoidance of costs associated with IT staffing, datacenter facilities expansion, and operational costs such as power and cooling. Without consolidation, all of these costs would have increased because larger numbers of physically separate servers would have been needed to support all of those workloads and to support all of the end users accessing servers. In an extreme case, one study participant was able to forgo an $80 million datacenter expansion.

Productivity Gains

Productivity gains were seen as IT system administrators were able to control more workloads (applications and databases). They were also able to leverage automation software that dynamically shifts resources to workloads as required and frees up resources when they are no longer needed.

Customers who consolidated distributed workloads on Power Systems using POWER6 technology saw the difference in the workloads they were running. "I estimate that there was a 30% increase in performance," one customer said. "This means more satisfaction with the end users. It makes us more competitive in some ways. The satisfaction of my customer makes our company more competitive…"

Management consoles provide a unified view of system resources, and of virtual machines running on the server, in contrast to separate views of physical servers that have come to characterize the server sprawl seen in many of the datacenters that

have deployed large numbers of volume servers, especially in the Web and application tiers of the datacenter. The consolidated platform enables IT staff to reduce time spent on maintenance and routine operations by 5–50% depending on the task, freeing up resources to help execute expansions and other IT initiatives (see Table 2).

As a result, IT can focus more of its time and resources on higher business impact activities. As one manager explained, "Application managers are saving time, for sure....The heavy techs…the engineers' productivity...has gone up 50%. The datacenter ops guys are running a lot more than they used to."

TABLE 2

Selected IT Operational Services Task Savings Due to Consolidation of Servers

IT Operational Services Task	% Reduction of Task Time Due to Consolidation
Server and operating system configuration	50
Tuning/customization/ongoing management	50
Deployment (server)	33
Problem management	30
Management software tools	30
Application development environment support	25
Configuration database maintenance	25
Data backup	17
Disaster recovery	17
Change management	10
Security management	8
Audit trails management	5

Source: IDC's Business Value Research, 2010

End-user productivity was enhanced as well. Reducing server downtime by 94% and server-related help desk issues by 92% returned each user 52 hours per year, saving $31,580 per 1,000 users.

Customers who had deployed POWER6 systems said that Power Systems typically showed higher uptime levels than many of the servers in the x86 category of servers that had been deployed in their organizations. "The improved reliability translated into smoother business processes," said one IT executive.

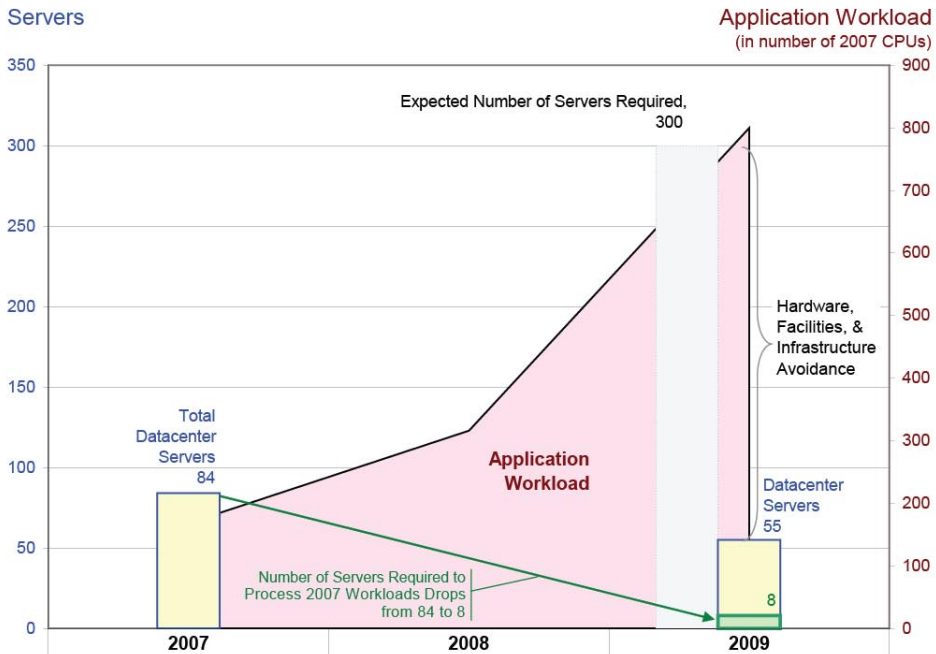
One Customer's Experience

The actual experience of one major retail enterprise, interviewed as part of the IDC study, shows the way in which deploying scalable servers can slow the pace of follow-up hardware acquisitions given sufficient capacity to support workload growth. As depicted in Figure 2, this organization consolidated its original level of application workloads from a large number of distributed, 2-processor servers to IBM Power Systems servers, reducing the total number of servers that were required for the base workload from 84 to 8. This delivered all the IT staff, hardware, space, and other savings that were described

previously. However, during this period, the organization brought on a host of new projects, applications, and processing requirements that increased datacenter processing demand more than threefold. This site leveraged consolidation on Power Systems to avoid buying scores of new servers to accommodate this demand; instead, it handled the demand with the 55 servers that were already installed.

FIGURE 2

Consolidation Experience of One Major Retail Enterprise



	2007	2008	2009
Application Workload (in 2007 CPUs)	168	316	800
Expected Number of Servers Required	84	108	300
Total Datacenter Servers	84		55
Servers to Support Base 2007 Workload	84		8

Year

Note: Estimates of application demand were provided by survey respondents and measured in terms of 2007 CPU capability. Expected number of servers assumes Moore's law–level increments in CPU power (doubling every 18 to 24 months) and assumes industry-standard 2-socket servers.

Source: IDC's Business Value Research, 2010

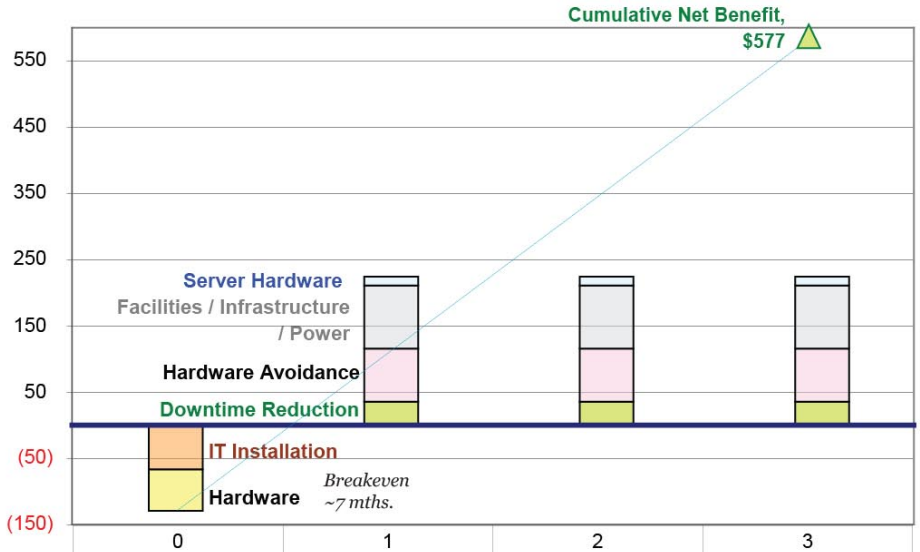
ROI Analysis

Consolidating heterogeneous server environments on IBM Power Systems is a major initiative for a customer site. In our study, companies invested significant time consolidating, often staging the consolidation in phases over several years. Costs were significant too, with the initial investment in hardware, software,

installation, and training averaging $87,350 per 1,000 users. The total investment over the three years averaged $128,690 per 1,000 users. However, the business benefits, as we have seen, were also significant, totaling $705,730 per 1,000 users over the same period. Figure 3 presents a summary view of these investments and benefits over three years.

FIGURE 3

Three-Year Pro Forma Consolidation Investment and Returns



	0	1	2	3
Hardware Investment	$(62)	$-	$-	$-
IT Installation Training / Labor	$(66)	$-	$-	$-
Server Hardware Savings	$-	$14	$14	$14
Facilities/Infrastructure/Power Savings	$-	$95	$95	$95
Hardware Avoidance Savings	$-	$80	$80	$80
Downtime Reduction Savings	$-	$36	$36	$36
Cumulative Net Benefit	$(129)	$107	$342	$577

Year

Source: IDC's Business Value Research, 2010

IDC computes ROI by using a discounted cash flow analysis. Using IDC's standard discount rate of 12%, the average company deploying Power Systems to consolidate (and extend) its server environment could see an ROI of 339% and payback in less than eight months from initial deployment (see Table 3).

TABLE 3

Return on Server Consolidation Investment*

Category	
Total benefits (discounted)	$565,520
Investment	$(128,693)
Net present value (NPV)	$436,330
Return on investment (ROI)	339%
Payback	7.8 months
Discount rate	12%

*All values per 1,000 users; three-year time horizon

Source: IDC's Business Value Research, 2010

The ROI calculations use the following calculation rules and assumptions to develop a rationalized, consolidated view of financial results:

- All IT solutions require a deployment period. The full benefits of the solution are not available during deployment. To capture this reality, IDC prorates the benefits on a monthly basis based on the average deployment term.
- To determine the net present value of the investment, we establish a three-year time horizon and discount all cash flows — positive (benefits) and negative (investments) — over the three-year period at a rate of 12%. This method accounts for potential outlays made at the time of deployment and interest on that expense.

CHALLENGES AND OPPORTUNITIES

IBM competes with other providers of scalable server systems, including HP and Oracle/Sun, which provide scalable Unix server systems and are the two primary competitors. IBM has been growing its market share in the Unix server market in recent years, reaching a number 1 ranking in 2009. The introduction of new server products into this marketplace, which is expected to accelerate into 2011, means that it will remain a competitive one. IDC will continue to monitor the worldwide server market, and the Unix server segment, and to report supply-side data associated with new server shipments on a quarterly basis and an annual basis.

The decision to deploy new enterprise servers is often characterized by a sales cycle that is longer than that of volume servers that are added to racks and blade server chassis. Power Systems offer options so that customers may choose to deploy smaller models in rack-optimized and bladed server combinations or to deploy larger midrange and high-end systems, as needed. One challenge IBM faces is that it needs to make clear to the marketplace that Power Systems are available as "building blocks" for the datacenter and that the price range for the IBM Power Systems product line — which is known for its midrange and high-end models — extends into the volume space for servers priced less than $25,000. Opportunities for Power Systems are broad, including longtime uses to support transaction processing, scalable databases, enterprise applications, email, and Web-enabled applications, including Java and Linux applications. Regarding vertical market segments, it is widely known that Power servers support Unix workloads in the financial services,

telecommunications, and government segments. It is perhaps less known that Power servers support Unix deployments in the healthcare, retail, logistics/distribution, and manufacturing segments. IBM has opportunities to sell Power Systems into Unix systems deployments and workload consolidation deployments in the Unix and Linux spaces — and to sell these systems as scalable resources for net-new deployments in Asia/Pacific, Central Europe, Latin America, and Africa, where enterprise infrastructure is being built out to support rapidly increasing computing demands.

Further, the flexible computing demands seen in cloud computing can be addressed by IBM Power Systems, as cloud computing moves increasingly to provide enterprise-level business services. To that end, IBM can sell Power Systems to cloud service providers for public clouds or to IT customers for private clouds; in addition, it can deploy them within its own group of nearly 15 IBM cloud computing centers worldwide.

CONCLUSION

Today's business organizations need more computing power than ever before but are keeping expenses under close management to make sure they don't spiral out of control. One technique to control operational costs over time is to consolidate workloads onto fewer physical server "footprints." It has proved to be a very useful IT approach during the economic downturn, leveraging shared-resource virtualization and flexible IT management.

When IBM Power Systems are deployed, they can be platforms for workload consolidation from Unix servers. This is true for consolidating workloads not only from Unix servers but also from x86 servers. Often, the application that is running on the x86 servers is also available to run on the Power Systems servers, under Unix or Linux.

IDC's study of a group of companies in the Americas and Europe (EMEA) that acquired IBM Power Systems shows that dramatic savings are possible.

Consolidating on Power Systems not only reduced the costs associated with supporting existing workloads but also brought productivity gains for end users, maintenance cost reductions, IT staff and management cost reductions, and fewer power/cooling and footprint demands.

Power Systems' scalability allowed these enterprises to avoid the costs of buying and deploying more servers as their application workloads inexorably increased — demonstrating the business value of consolidating onto scalable server platforms.