WHITE PAPER

The Cost of Retaining Aging IT Infrastructure

Sponsored by: HP

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IDC OPINION

Many organizations, when faced with budget challenges, put off capital expenditures (capex) and seek alternatives to acquiring new hardware platforms, such as lengthening server life cycles and extending software licenses. This pattern of stretching the useful life cycle of servers has a number of near-term benefits for customers in terms of depreciating assets over a long period of time or prolonging an existing lease. But if a transition to new technologies has been deferred too long, then the time comes when the system has fallen far behind the performance and cost-efficiency levels being offered by multiple vendors in the marketplace today. This has been especially true in recent years, as the performance of processors has more than doubled each year, based on the emergence of multicore, multiprocessor system designs with improved system speeds.

This paper demonstrates that a buy-and-hold strategy can actually add costs to the datacenter, for a number of reasons, as systems age in place:

☑ Hardware maintenance costs rise over time, and performance lags behind more current server offerings.

☑ Energy efficiency is not as advanced in older server models — leading to rising power/cooling costs in the latter years of the server's usable life cycle.

☑ Applications software and systems software fall behind the current versions available in the marketplace, and security may require frequent updates. After five years of use, the cost of replacement climbs.

To understand more about server replacement cycles and ongoing operational costs, IDC studied many sites that remained on an existing platform long after its initial introduction and then upgraded. When comparisons to the succeeding generations of technology are made, customers have found that the increase in scalability and performance of newer systems, combined with a reduction in server "footprint" size and overall power/cooling requirements, resulted in significant reductions in ongoing costs, or opex, per 100 end users supported.

This paper describes HP ProLiant Gen8 servers, the technology on which they are based, and the way they address many of the causes of operational costs found at customer sites. The hardware and software capabilities of the HP servers were designed to be proactive, reducing the effort and knowledge required to run the server systems and leveraging automation to reduce maintenance costs and IT staff costs.

SITUATION OVERVIEW

Saving Money by Leveraging Technology Refresh: How Current Accounting Misses

Most organizations continue to purchase their servers and IT equipment and then, following the initial investment, use a "standard" financially derived amortization period — often five years. Typically, this has led to a useful server life cycle of three to seven years, depending on the type of platform, operating system, and workloads being used. While most IT shops replace their x86 systems every three to five years, they have tended to hold onto their Unix servers supporting mission-critical workloads for longer periods of time — generally five to seven years or more — given the importance of the workloads being supported.

After acquiring and capitalizing equipment and then initiating the amortization period, most IT managers avoid making further changes, resulting in a delay in updating the systems or providing a technology refresh. Often, they do not replace the equipment before its normal depreciation cycle runs its course, as long as the system is performing adequately and meeting availability requirements. This approach to server replacement/renewal cycles misses an important assessment of the actual conditions and cost factors experienced. Instead, it relies on the calendar to determine when the server should be replaced or refreshed with new technology.

During this time, system administrators may work to repeatedly upgrade and reconfigure servers in support of workloads rather than to consider a fully burdened cost assessment highlighting the cost reductions that could be gained by replacing the servers sooner. In many cases, a cycle of repeated upgrades, security patches, and rising maintenance and management costs can accelerate, over time, if the life cycle of the server is extended to four years or more.

Current Capital Constraints Contribute to Lengthened Server Life Cycles

IDC's supply-side data for the worldwide server market showed patterns of lengthened server life cycles. The data documented the delay and deferral of many midrange and high-end servers, starting in fall 2008 — at the onset of the economic downturn — and continuing through 2010. At that point, IDC saw an uptick in midrange and high-end server sales, including non-x86 server systems, that was fed by a wave of technology upgrades across those server classes. At the same time, the level of investments in x86 server technology has grown, now generating more than 95% of server unit shipments per year and more than 65% of server market revenue per year.

Following the 2008–2009 downturn, the recent rise in server market revenue reflected that a technology replacement cycle was under way. There were also indications that IT organizations needed to acquire new hardware platforms while taking advantage of leveraging virtualization to consolidate workloads onto fewer server platforms for the sake of operational efficiency and reduced IT costs.

Focusing on Operational Costs

The drive to reduce capital expenditures is strong and understandably so given the current economic climate. However, IT managers also know that the need to address opex within the datacenter is equally important.

Although IT managers did a good job of capping IT spend on servers and storage throughout the economic downturn, costs on the operational side of the IT organization continued to grow. Starting in the late 2000s, and throughout the economic downturn period, costs for maintenance and management, along with costs for power/cooling, have soared. Power/cooling costs grew eight times as fast as server acquisition costs — and costs for maintenance/management, viewed as a category, grew four times as fast as server acquisition costs.

Maintenance/Management Costs and Power/Cooling Costs Rise over Time

As Figure 1 shows, by 2010, maintenance/management costs generated twice as much in total IT costs as server acquisition alone — and power/cooling costs grew enough to nearly equal server acquisition costs worldwide; in some cities, power/cooling costs already outstripped the server acquisition costs. Meanwhile, the worldwide installed base now stands at more than 35 million units and is projected to grow even more. Fortunately, the growth in logical servers (virtual servers or virtual machines/VMs) is providing more usable capacity per physical server — and this is improving server resource utilization for each server — over time.

Worldwide Spending on Servers, Power and Cooling, and
Management/Administration
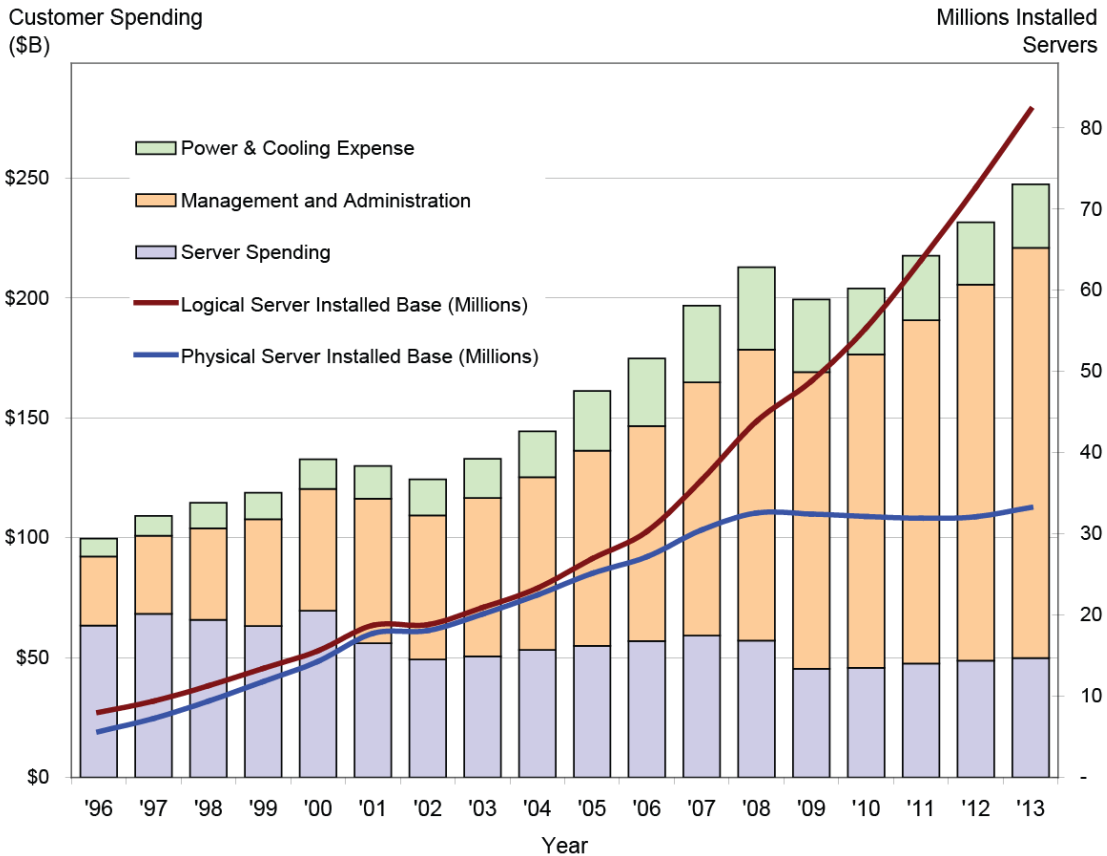
Source: IDC, 2012

Server Replacement Cycles

What does this pattern of maintenance, management, and operating costs mean to
server life cycles? How has this changed since 2010?

Figure 1 demonstrates that opex must be kept in check, or it will outpace the savings
from deferred server acquisitions. Certainly, midrange and high-end server revenue
and unit shipments have been held in check since the economic downturn began in
fall 2008 — but IDC supply-side research found that midrange and high-end servers
saw a return to revenue and unit growth in 4Q10 and 1H11. The changes in the
supply-side data indicate that a period of technology replacement has begun as
workloads are being consolidated onto fewer, more powerful platforms.

There are other signs of technology refresh: IDC's customer-based study of
Server Workloads found that technology refresh helped address opex. In 2010, the
IDC Server Workloads study of 1,000+ IT sites found that 39% of new server
acquisitions occurred as part of a routine, or planned, server refresh. New application

projects drove another 33% of new server purchases, and 28% more were acquired to support additional compute capacity.

As we see in this white paper, aging server infrastructures can play a substantial cost-adding role in datacenter cost dynamics. The trend to leverage VMs running on the hardware is key to improving resource utilization — and to providing highly granular controllability of workloads. Further, workload isolation is enforced, which preserves uptime by preventing workloads from interfering with one another — taking a "pooled resources" approach to computing resources.

IDC'S STUDY OF SERVER TRANSITION EXPERIENCE

From 2008 to 2011, IDC studied more than 50 sites that had upgraded their server infrastructure to determine the business value experienced by customers consolidating on newer servers. The study highlighted the experiences at sites that had consolidated disparate server workloads on newer servers. These companies range in size from 1,500 to 175,000 employees and are located across geographies, including the United States, Western Europe, and Central Europe.

Importantly, the organizations represent a wide variety of vertical markets, including retail, financial services, manufacturing, and energy. Most of these organizations are large companies with a server infrastructure that supports tens of thousands of intra-enterprise end users — and an even larger number of extra-enterprise users, including end customers who are accessing their enterprise systems.

This study provided substantial data about the organizations' deployments 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, reductions in costs related to system downtime, and employee productivity improvements associated with those deployments.

Research Methodology

This study used research interviews to determine the sources of cost — both capex and opex. By capturing these components of cost, IDC was able to calculate the impact of moving from older servers to new servers in terms of hardware acquisition costs, IT staff costs, downtime, and productivity — both for IT staff and for end users.

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 varying periods. IDC's Business Value team combined all of these factors in the synthesis of an overall cost of aging infrastructure assessment.

Key Findings

IDC's customer-based research found that failure rates began to climb as servers aged into their fourth year — and beyond. It found that upgrading resulted in a return on investment (ROI) of more than 150% over three years. Importantly, savings from the technology transition covered the initial investment (payback period) after less than a year (11.7 months).

The savings from reduced maintenance and support costs paid for the investment in new technology. While servers have become much more powerful over time, acquisition costs and energy requirements for power and cooling have dropped dramatically. The IDC study found that, for every dollar invested in the new technology, two and a half times as much was eventually saved, over a period of three years, per 100 users using the new system.

Research consistently showed that upgrading from aged servers to newer server platforms reduced cost and increased performance. Two recurring factors appeared to directly affect these benefits of upgrading:

☑ Servers experience an optimal life span, and continued usage beyond that optimal life span causes maintenance costs to spiral and downtime to increase.

☑ Newer platforms consistently provide the price performance increases inherent to Moore's law at lower power consumption.

As Figure 2 indicates, as servers age beyond the 3- to 3.5-year optimal replacement cycle, the cost of annual maintenance increases annually by 24% to 44%. Multiple conditions contribute to this increase. Older systems break down more frequently as average failure rates increase from 7% to 18%. Operating system software and application software designed for three-year optimal life experience more issues. Beyond that threshold, patching becomes a more frequent activity — and most companies lose interest in keeping up with the more frequent upgrades. Migrating to newer software while running on the same hardware platform creates compatibility issues and business alignment issues of its own.

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Effects of Time on IT Infrastructure (Server) Costs
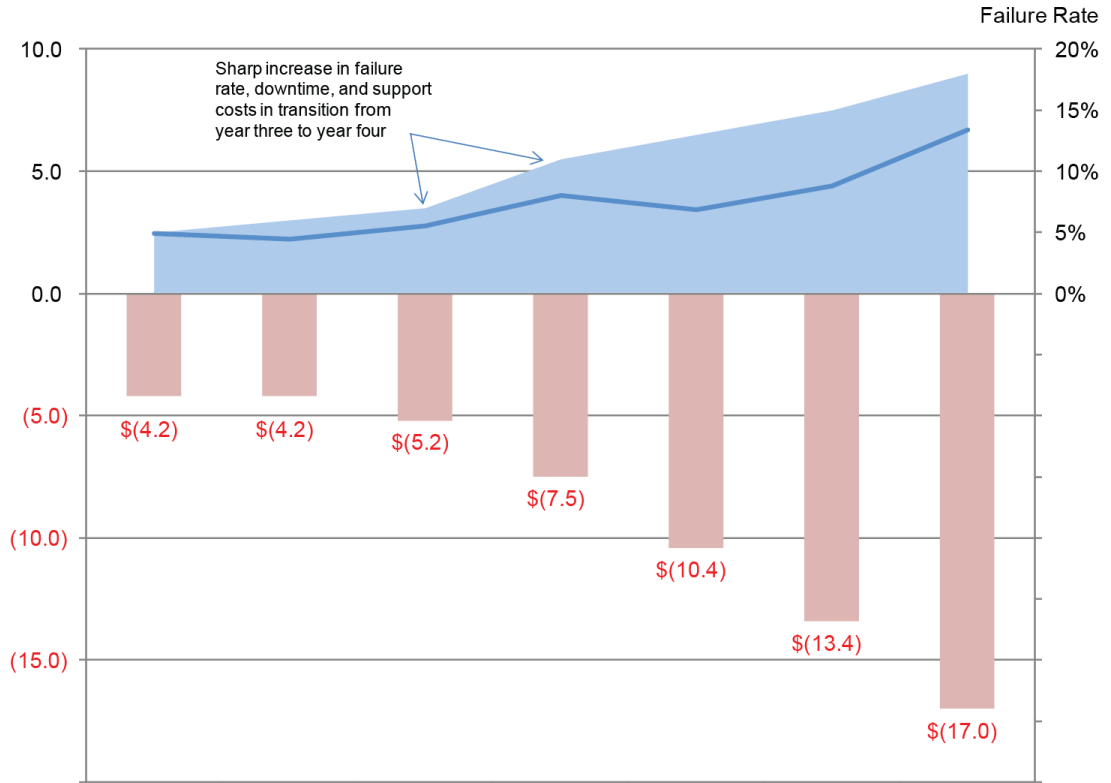
Server Age (years):	1	2	3	4	5	6	7
Failure Rate	5%	6%	7%	11%	13%	15%	18%
Support Cost	$(4.2)	$(4.2)	$(5.2)	$(7.5)	$(10.4)	$(13.4)	$(17.0)
Downtime	2.5	2.2	2.8	4.0	3.4	4.4	6.7

Notes:

- Support cost values equal annual cost in US$ per 10 users.
- Failure rate refers to the frequency of failure per year and per server based on the age of the server.
- Downtime refers to hours of downtime per year.

Source: IDC's Business Value Research, 2012

To create an IDC Dynamic White Paper that estimates expected cost savings for your organization, click *here*. This tool will create a customized version of this White Paper with the results of your estimated cost savings inserted.

To understand the reasons these upgrade changes become so pronounced, one needs to look at the technology changes between generations of servers, which we describe in the following sections.

HOW NEW TECHNOLOGY IMPROVES BUSINESS

Innovations in HP ProLiant Systems

HP ProLiant systems have introduced new technologies with each new generation of systems design. With its HP ProLiant Gen8 servers, HP increased the automated management capabilities of the servers by embedding special firmware and logic directly on the system motherboard. This built-in intelligence addresses the variation in IT skill sets at customer sites so that successful deployments and maintenance best practices take place in a consistent way. This approach enables ongoing operations and avoids unplanned downtime.

HP ProLiant Gen8 servers are designed to reduce the time and costs associated with installing, provisioning, and maintaining these systems, including the DL rack-optimized servers, the BL blade servers, the ML tower servers — and the SL scale-out servers for cloud computing and service providers.

Innovations in the HP ProLiant Gen8 design improve problem detection, monitor system temperature, and launch responsive actions to keep the server within a series of preset parameters. The features proactively seek any signs that hardware components might fail and forward the related operational information to a unified console — providing a comprehensive view about the "state" of the system. Equally important, the system has the capacity to take many actions that will allow it to stay online, without further intervention by IT staff. For small and medium-sized business (SMB) sites — and for large organizations with remote business units — these capabilities are designed to reduce the number of actions that must be taken, throughout the server life cycle, to maintain smooth operations.

HP ProLiant Gen8 Servers with HP ProActive Insight Architecture

In designing its HP ProLiant server products, HP focused not only on improving performance but also on how to resolve the escalating problems of managing a server throughout its life cycle while avoiding downtime for planned and unplanned outages. HP leveraged its service databases, reviewing patterns in system conditions that have been made evident over a period of 20 years of incident responses. This review formed the automation features that have been built into the HP ProLiant Gen8 design. Design components have been built into the hardware at the system-board level, instrumenting them to respond to a variety of operational conditions and triggering remediation of many of the negative conditions, including firmware conflicts and memory faults.

HP addressed the customer issues that were revealed in IDC's customer-based research. As Figure 2 shows, while there is some advantage to lengthening server life cycles, a "knee in the curve" develops in year 4, which makes continued operation of the server progressively more expensive over time. It reaches a point of diminishing returns by years 5, 6, and 7 — making it more expensive to operate older servers by a factor of 2.5 (server administration and support costs in year 5 versus those costs in year 1) as failure rates increase and support costs rise sharply.

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HP ProLiant Gen8 Design Addresses Operational Costs

To address these costs of operation, HP is providing HP ProActive Insight architecture, a multifaceted set of capabilities for HP ProLiant Gen8 servers that directly address many causes of planned and unplanned downtime. HP ProActive Insight architecture delivers these new capabilities across four major categories of server use as follows:

☑ **HP Integrated Life-Cycle Automation.** HP has focused many of the enhancements in its HP ProLiant Gen8 on addressing IT organizations' increasing challenge of administering the IT environment. Many of the features are designed to simplify and automate as much as possible, with servers now executing or easing many of the life-cycle tasks that add to system administrators' management overhead. Each HP ProLiant Gen8 server now incorporates scores of onboard functions for identifying the current state of the server (e.g., firmware, provisioning location, operating system version, hypervisor, warranty status) and operating variables (e.g., temperature, memory usage, power utilization). The HP ProActive Insight architecture uses this data to centrally manage and automate operations, where needed. This approach to system administration and management gives clients a fuller view of the installed environment — even as it automates and simplifies system provisioning, problem troubleshooting, and the process of periodically installing software updates.

☑ **HP Dynamic Workload Acceleration.** To accelerate data-intensive application performance, HP engineers tuned the system architecture for solid state technology and to improve data caching size and speed, increasing the number of storage drives that each server can support and extending cached data retention to avoid data loss. HP has also expanded customers' options for integrating storage and compute resource. This approach brings storage and compute closer together and eliminates much of the cost and complexity. It addresses the most common performance bottleneck — storage. The addition of the data protection analytics and the intelligent performance features is aimed at improving overall system performance at a time when customers are discovering that the amount of data for each workload is rising rapidly.

☑ **HP Automated Energy Optimization.** As highlighted in Figure 1, many IT executives are struggling with the space, power, and cooling required to host additional systems in an already-crowded datacenter. To address this challenge, HP has extended the HP ProActive Insight architecture to provide more intelligent sense-and-respond technologies that reduce the electrical power and airflow needed to operate HP ProLiant Gen8 servers. For example, the expanded web of temperature sensors, which HP calls the HP 3D Sea of Sensors, detect more precisely the part of the server that needs cooling, direct fans to this area, and reduce unnecessary fan power by dozens of watts per server. This approach allows workloads to be run in less space, with fewer power and cooling requirements than in previous generations of HP servers. It also reduces the amount of manual checking for power and rack configurations, which often leads to inefficient onsite management, manual configuration errors, and downtime.

☒ **HP Proactive Service and Support.** HP expects this combination of information and automation to lead to an improved IT service experience, whether that service is provided by HP or by its channel partners. As part of the HP ProLiant Gen8 release, HP created a comprehensive IT management and support solution to integrate and take advantage of the centrally consolidated repository of service outcomes that HP has gathered over 20 years. HP ServiceONE support teams can now leverage this information to help clients as they proactively resolve issues and deliver real-time insight leading to quick resolutions while continuously improving datacenter operations through quick repairs and optimized "windows" for planned downtime. For example, HP support can alert customers and act on conditions such as degrading performance, memory errors, or other service conditions well before customers are aware that such actions should be taken. This access has been strengthened through use of a cloud-based "portal" that delivers customer service information. This will help customers with limited IT staff reduce periods of planned downtime and avoid unplanned downtime.

Reducing Administration Costs

As we have seen in this paper, operational costs for IT staff time, power/cooling, and responses to unplanned downtime combine to drain IT budgets. However, to the degree that any, or all, of these cost factors could be reduced, then the operational costs and the ROI to acquire the computers would be reduced.
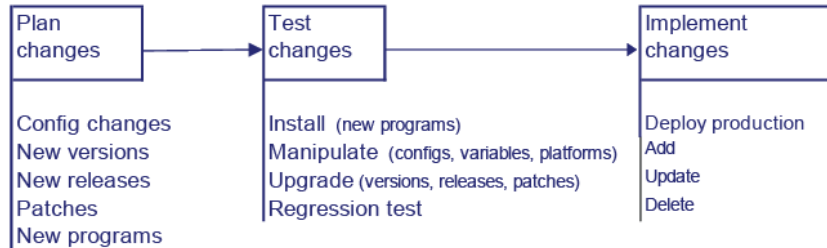
As servers age in place, the number of service incidents tends to increase over time. That means that close oversight of all of the components — and the ability to address any failing components prior to disruption of business services — is critical to maintaining business continuity. HP has long provided such oversight through its HP Integrated Lights-Out (iLO) technology and other system management software capabilities, but it has greatly expanded them, in terms of granularity and coverage and automation, in every HP ProLiant Gen8 server. As discussed, the HP ProActive Insight architecture's embedded management features support the complete life cycle of the server, from initial deployment, through ongoing management, to service alerting and support. These features address some of the most time-intensive server administration functions, which are illustrated in Figure 3. They reduce the time it takes for IT administration tasks such as deploying, managing, and servicing the virtualized and physical server infrastructure.

Server Life-Cycle Administration **Functions**, **Objectives,** and Steps

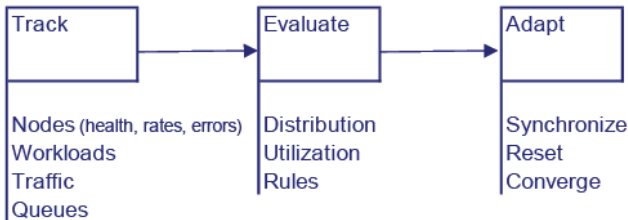## Initialize / Maintain Systems Configuration
Interoperating Software Capabilities

Plan changes	→	Test changes	→	Implement changes

Config changes
New versions
New releases
Patches
New programs

Install (new programs)
Manipulate (configs, variables, platforms)
Upgrade (versions, releases, patches)
Regression test

Deploy production
Add
Update
Delete

Balance / Reallocate Processing Tasks
Evenly Distributed Workloads

Track	→	Evaluate	→	Adapt

Nodes (health, rates, errors)
Workloads
Traffic
Queues

Distribution
Utilization
Rules

Synchronize
Reset
Converge

Regulate Device
Continuous Machine Operations — memory, CPU, storage, connections

Monitor conditions	→	Report conditions	→	Identify out of norm	→	Make correction

Source: IDC, 2012

Software and Hardware Capabilities

Firmware and software capabilities ensure that organizations install the appropriate version and release number of the system-level software on the new servers. HP Intelligent Provisioning provides a fully integrated tool for system configuration and operating system installation. This allows system administrators to identify and correct configuration errors before new servers are deployed. The built-in smart update capability recognizes whether the system software is out of date and automatically downloads the latest update, if needed. In addition, HP Active Health provides 24 x 7 automated monitoring, self-diagnosis, and alerting for the HP ProLiant systems.

Hardware-based mechanical improvements increase productivity and uptime as well. For example, at initial physical provisioning and deployment, the HP Smart Socket guide ensures proper processor placement and installation, preventing motherboard damage and downtime that might otherwise result when processor pins are damaged.

The HP Smart Drives prevent common causes of data loss, such as the untimely removal of an active drive, and do so through a new, brightly lit LED display showing that disk activity. In addition, upon installation, the new HP racks are able to automatically register a server's location in a rack, recording its position for later asset reporting. In support of server software configuration steps, the server records and reports a series of server configuration details to the central console. These details include the firmware state, the operating system version, the hypervisor version — and the boot procedure that was used. In addition, HP ProActive Insight tracks and reports on the warranty and service status of each device. The entire HP ProActive Insight architecture supports not only the customer's IT staff but also HP's extensive worldwide network of thousands of service professionals who monitor and alert from their local vantage point. The entire solution reduces touches, reports on errors before they occur, and, in general, reduces the downtime and associated labor of system failures.

Measuring What You Manage: Data for Automated Management

Many customers of x86 servers are facing rising costs for maintenance and management of those servers over time. These challenges are compounded by the economic uncertainties that are causing IT budgets to be limited, or reduced, for 2012. That is why efficient management and care of large numbers of x86 servers is becoming vitally important to many customers in SMBs, midmarket companies, and large enterprises.

Efforts to reduce manual processes traditionally used by IT staff will directly result in operational cost reductions; therefore, technologies aimed at automating repetitive tasks are well-suited to address these customer pain points.

Key to the automation process is the collection of server data and of parameters indicating the health of the server system. The system proactively monitors the servers via sensors, and this information informs the management console about whether components need to be replaced or turned off prior to replacement.

Leveraging HP's Converged Infrastructure

Leveraging all of the assets listed earlier, along with leading offerings across the storage, system, and network domains, HP has been providing converged IT infrastructure in virtualized environments for many years. By design, HP's Converged Infrastructure (CI) — combining server, storage, and networking components in the same server-based solution — consists of preintegrated, tested, and supported solutions. These CI solutions are optimized for cloud, virtualization, and next-generation applications. HP intends for these systems to reduce time and cost demands on IT staff resources and to reduce the amount of time required for planning, procurement, and deployment, accelerating the time to value for acquiring the server solution.

HP provides customers with several options:

☑ HP VirtualSystem simplifies and extends converged infrastructure into optimized, turnkey solutions for server and desktop virtualization. HP designed it to deliver a high-performance virtualized environment with pretuned server, storage, networking, management, and hypervisor resources. The HP VirtualSystem is targeted for use cases including hosting one or multiple applications — including mission-critical applications — and provides the foundation for the next level of system, the HP CloudSystem.

☑ HP CloudSystem is an integrated system for building and managing services across public, private, and hybrid clouds. It combines Converged Infrastructure with HP Cloud Service Automation software, providing a cloud platform that aims to increase the agility of enterprises and drive revenue growth for service providers.

☑ HP AppSystems is a portfolio of integrated systems that have been optimized for dedicated workloads such as data management, business reporting/analytics, and collaboration. HP designed and tuned HP AppSystems for rapid deployment, application performance, and support for service-level requirements.

IT Benefits

System administrators spend a lot of their working hours checking on mechanical devices, such as electrical cables, power cords, system board connections, fans, and the like. This work is time and labor intensive. Building in connections and components directly on the system boards reduces the total number of connections that must be checked, time and again, by system administrators. By detecting hardware component issues in a more automated way, the HP ProLiant Gen8 technologies reduce the time associated with identifying and diagnosing server hardware issues and speed the time to resolution of those problems. All of this reduces IT staff time associated with deployment of physical servers and ongoing maintenance.

Unplanned downtime has a big impact on operational costs and must be avoided wherever possible. Preventive maintenance of hardware components — replacing the components prior to an actual failure — reduces unplanned downtime appreciably. "Phone home" capabilities provide an early warning system, allowing administrators to proactively replace system components and avoid actual downtime.

Finally, upgrades and updates for any given server — multiplied by tens or hundreds of servers — result in major costs within the enterprise datacenter. Automation of care/maintenance avoids needless duplication of effort, reduces the number of physical tasks, and helps avoid downtime.

Business Benefits

Today's businesses rely on hundreds of servers operating efficiently — and doing so on a 24 x 7 x 365 basis. Any prolonged disruptions in these operations, which businesses sometimes call "computer glitches," are simply unacceptable because they affect the availability of applications and databases being accessed by employees and by end customers. Therefore, any interruptions are to be avoided. In the event that processing is interrupted by an outage, it must be able to resume on other systems as quickly as possible.

The ability to manage all servers from a single point of view, or console, has the advantage of reducing time associated with identifying a problem in the first place. HP has given all of these factors consideration in its HP ProLiant Gen8 servers, making it easier to identify and to address hardware problems and to restart workloads on alternate servers, if needed. There are at least two approaches to achieving those operational goals: hosting more VMs per physical server — and allowing them to migrate to alternate servers for future use — and clustering systems that support key workloads; the clustered systems would allow applications to restart on other, connected machines. Finally, HP is leveraging the use of cloud technology to gather "server state" information and to make it universally available across all the "sites" at a customer installation. This access to a cloud portal for first-line response supports rapid response to any hardware operational issues and opens up the HP ProLiant Gen8 deployment scenarios to remote locations and to a variety of SMB sites that have few, if any, IT staff onsite to provision and manage new servers.

Technology Transition: Before and After

As servers age in place, various cost categories show that spending gets steeper as time goes on. These categories include maintenance costs; costs for power and cooling, managing, and monitoring servers; and staff costs. However, according to a demand-side, customer-based study conducted by IDC, a server transition that takes into account all these factors offers surprising findings that contradict and challenge traditional IT depreciation cycles. Based on respondents' experiences with technology refresh, the study shows that IT investments in new technology pay off in less than a year — and that the cost savings benefits over three years are more than three times as much as the initial amount invested.

The IDC study found that transitioning server infrastructure on pace with newer technology (e.g., every two years) can reduce multiyear server costs. This occurred not only because today's servers can handle comparable workloads at less than 40% of the aggregate power requirements that older servers require but also because of HP's advanced technologies, which in turn reduce maintenance overhead and IT labor costs.

Other cost savings benefits can be added to this list. They include administrative labor associated with physical equipment management and cabling, as well as upgrades to firmware and the associated regression testing prior to production deployment.

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Because of the high cost and potentially disruptive nature of upgrades, IT organizations strive to avoid this activity. Nevertheless, as the length of the deployment increases, the cost of maintenance per server increases. Because newer servers require less of this type of maintenance and management, labor cost savings ensue. Operational expense factors can be materially reduced with newer servers.

CHALLENGES AND OPPORTUNITIES

The worldwide server market is a competitive one, with four top systems vendors worldwide and dozens of others competing more closely at the regional and country levels. Server platforms continue to compete in terms of price, performance, and price/performance as well as in their capacity to support and manage virtualized workloads and their ability to provide reliability, availability, and serviceability to IT staff and end users.

For all vendors, product differentiation and a timely response to changing business conditions are key to meeting customer expectations regarding technology refresh for each product life cycle.

In the server market, there are four top vendors in terms of revenue — and HP is currently ranked a leader by revenue in worldwide annual sales. This large market share can be attributed to HP's deep investments, which led to the continued development of HP ProLiant and the associated virtualization and systems management software.

HP recognizes that its ability to integrate functionality into the platform (e.g., hardware and software), while supporting open computing standards for software and key hardware components (e.g., I/O, software APIs), is the basis for much of its differentiation and business value as it goes to market with its server solutions. That is why HP is emphasizing its role as a provider of cost-effective workload server platforms that will support business continuity and business value based on customer usage patterns and ongoing service requirements.

CONCLUSION

As we have seen, the continual increase in computing power, which is more than doubling every two years, counters the conclusion that avoiding new equipment and capital expense is the best way to reduce capex acquisition costs.

As organizations consider server transition in their datacenters, they also should consider incorporating a full accounting of all of the relevant factors — including not only capital costs but also labor, power/cooling, and electricity costs. This type of analysis, including avoidance of opex costs, may provide surprising conclusions, showing long-term cost projections over the server life cycle that challenge traditional IT depreciation cycles.

One example of this approach is replacing older server technologies that have been supporting specific workloads over many years. In-depth IDC interviews show that sites that have updated server technology have reduced many types of operational costs,

including costs of IT staff time for maintenance and management, per-workload energy costs, and facilities costs. Respondents reported that through the process of workload consolidation, they can run more workloads in less datacenter space with newer systems than they could with previous-generation systems.

Refreshing server infrastructure on pace with newer technology — including server acquisition costs, IT staff costs, and power/cooling costs — can reduce opex by as much as 33%, as we have seen in this paper. Rather than put off capital expenditures and extend server life cycles (buy-and-hold strategy), organizations that are faced with sharp budget challenges should consider selectively upgrading their servers to the latest available technology, targeting the workloads that would benefit most from workload consolidation, including demanding workloads that require high levels of availability and high levels of security.

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