The business case for HP BladeSystem

A guide for financial and IT managers of mid-sized businesses

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Introduction

The modular and integrated design of HP BladeSystem provides a clear advantage over traditional infrastructure in terms of total cost of acquisition (TCA), and total cost of ownership (TCO). This paper will help financial managers and IT managers understand the benefits of TCO so you can build a solid business justification for your technology purchase. This paper is not a hypothetical benchmark or magic answer for how much less blades cost versus traditional server and storage infrastructures in all cases. There are simply too many variables. Instead, we will illustrate our points with a sample configuration and common sense examples of how blades save upfront costs, reduce administrator time, and extend your IT budget.

Total cost of acquisition (TCA): the total cost, including taxes and fees of an asset including peripheral equipment and the infrastructure needed to support it

Total cost of ownership (TCO): the total cost of acquisition plus costs incurred during the lifecycle of an asset for upkeep and maintenance

How expensive is a blade enclosure?
A typical blade enclosure starts at US$3,000 to $6,000. In most cases, individual server blades will cost the same or less than comparable rack or tower servers, depending on configuration. In many cases, the break-even point for blades versus a similar number of rack servers is at three to eight blades per enclosure.

Basics of total cost of ownership (TCO)

TCO is what it costs you not just to buy, but to maintain, and use what you buy. (TCA analysis only reveals upfront costs.) TCO analysis can help you uncover areas of potential cost savings over time. For example, when you purchase a car, the sticker price is not the end of all car-related expenses. You need to pay for taxes and insurance, buy fuel, oil changes, new tires, filters, belts, hoses, and so on. All of this contributes to the total cost of owning the vehicle. TCO also includes unscheduled problems, mechanics fees, and the costs of a broken-down car keeping you from a critical business appointment.

The typical economic life of a server is three to five years. TCO for servers is estimated to be as much as four times the cost of the initial server purchase due to the additional infrastructure needed to support the server, plus facility power, cooling, space, and administrator time required to set it up and maintain it. TCO for a server also includes hardware and software upgrades, technical support, software upkeep, training, and other maintenance.

TCO analysis can help you uncover a variety of hidden costs. For example, servers deliver a critical service to the business, its employees, customers, and partners. This includes customer database access, customer communications or online stores. The costs of these services being unavailable vary from business to business, but can be substantial.

How blades deliver savings

Blades have the same features as standard servers or storage and run the same applications. The key difference is that blades share a common infrastructure called a "blade enclosure." In a nutshell, a blade enclosure is an all-in-one infrastructure in a box.

Traditional servers and storage require additional infrastructure to run your applications, connect to other systems, and deliver services to the business. These include cables, network switches, and specific options on each server. In addition, each server has its own power supplies, cables and fans. And, servers are typically managed and updated individually. To protect against downtime, an additional server is often needed as a spare. Within an HP BladeSystem, modular resources are pooled and shared. This makes it easier to build, adapt, and maintain the common

elements of your infrastructure. It saves money and time by reducing maintenance events, cables, and switch connections. It also provides shared power and cooling that save upfront costs and help reduce monthly energy and air conditioning bills. Finally, the enclosure adds redundancy to each server to prevent unplanned downtime and makes it easier to allocate a single spare to protect many servers at once.

Sample TCO configurations

HP has a handy TCO tool available at www.hp.com/go/bladesystem/tcotool that helps you create a savings estimate based on your specific configuration needs. Using the HP TCO tool, we created a sample set of data (see Tables 1, 2, 3, 4) based upon a purchase of 8 server blades in a BladeSystem c3000 enclosure compared to 8 traditional 1U servers, each with LAN and SAN connectivity (see Appendix for server configurations). When you create your own comparison, you can choose more or less equipment, plus change the assumptions to suit your real and quoted costs.

Table 1. Sample TCA savings

	BL460c server	1U Intel® server	Blade savings blade
Server costs	$43,168	$46,936	$3,769
Ethernet cable costs	$125	$600	$475
Ethernet port costs	$1,799	$6,888	$5,089
SAN cable costs	$1,208	$10,020	$8,812
SAN port costs	$11,998	$15,998	$4,000
Rack costs	$1,489	$1,489	—
Savings			**$22,145 27%**

Server and storage blades install into a blade enclosure without wires. All network signals are combined and sent to outside network and storage through blade switches in the back. These switches can reduce the number of network cables by up to 94 percent, as well as use fewer switch ports on more expensive core switches. The upfront cost advantages of blades primarily come from the integrated networking design which removes many cables, options, and additional equipment. This is why, in almost all cases, blades are the most affordable way to connect your servers to a SAN environment, even with as few as one to three servers. The HP BladeSystem also removes the need for KVM switches and cables by providing remote management capability built in.

Table 2. Sample software and services savings

	BL460c server	1U Intel® server	Blade savings blade
Management software	$2,784	$4,392	$1,608
Hardware support: 3 years, 24x7	$3,766	$4,400	$634
Installation and startup	$4,240	$11,200	$6,960
Savings			**$9,202 46%**

HP management software and services offer many cost savings. They allow you to fully take advantage of the shared design of blades, easy installation and maintenance to pass substantial savings along to your business.

Table 3. Sample operational costs savings

	BL460c server	1U Intel® server	Blade savings blade
Data center space cost	$750	$750	$—
Power usage costs	$4,919	$7,212	$2,293
Cooling costs	$4,919	$7,212	$2,293
Savings			**$4,586 30%**

There are dozens of other areas of potential operational cost savings in administrative time, uptime and flexibility—beyond just space, power, and cooling. HP account managers and partners have access to even more robust TCO analysis tools backed by cost benchmarks collected from hundreds of clients and industries to help you create a comprehensive report specific to your upcoming project.

Table 4. Sample TCO savings

	BL460c server blade	1U Intel® server	Blade savings
Totals	$81,165	$117,098	$35,933
Savings percentage			**31%**

HP ProLiant BL460c in a HP BladeSystem c3000 enclosure

Tower version of the HP BladeSystem c3000 enclosure with HP Onboard Administrator Module, filled with HP Proliant BL680c server blades

Variables affecting blade purchase cost
If a $3,000 blade enclosure is shared by only five blades versus the full 8 available, the cost per blade will be higher because the amortized cost of the blade enclosure—shared cables, rack space and network switches—is divided among fewer blades. As a general rule, more blades per enclosure yields lower acquisition costs.

According to the Giga Group, up to 25 percent of a system administrator's time is spent on cable management. To make matters worse, cable failures are a prime cause of downtime.

Hidden costs and additional TCO advantages

Many different aspects of blade design help reduce costs and mitigate risk. The most common TCO improvements come from administrator productivity gains, the flexibility of the modular design, power and cooling savings, and less planned and unplanned downtime.

Table 5. Blade features that save costs

	Improvements in TCO
Blades need fewer cables and other network equipment.	• This saves hours or more in initial setup time and accelerates server replacement and maintenance. • With technologies like Virtual Connect, blades can be added, replaced and recovered through software, saving the time of LAN, SAN and server administrators. • Each cable is a potential point of failure; blades offer redundant connections to more servers but with fewer cables. • By obstructing server vents, racks or underneath raised floors, cable sprawl can force server fans and air conditioners to use more power for cooling.
Blades are modular with fewer moving parts.	• Simplifies capacity planning because the infrastructure behind the servers is already in place • Streamlines asset management and retirement • Modularity leaves room for faster expansion and upgrade of your existing infrastructure. • Simplifies maintenance, initial setup and repairs • Is interchangeable, with fewer spare parts to order and less spare inventory
Blades use less floor space with more servers per rack.	• Enables more efficient utilization of IT infrastructure floor space • Delays future construction, upgrade and expansion needed to accommodate IT infrastructure growth • Reduces overhead expenses based on square footage and depreciation of the HVAC infrastructure
Blades use less power and require less cooling.	• Lowers server power costs on monthly bills • Reduces strain on air conditioning by generating less heat • Improves ability to increase power and cooling efficiency by identifying hot and cool spots
Integrated management tools improve administrator productivity.	• A shared view of infrastructure assets simplifies resource management and makes it more efficient. • Simplifies troubleshooting and repair time • Accelerates project time lines and the deployment process between development, testing and production • Reduces maintenance needs by reducing the number of servers running given applications • Can be a significant step forward to standardize on a given OS or hardware platform • Speeds maintenance to reduce planned downtime
Blades provide built-in redundancy and self-monitoring.	• Opportunities for improvement in reliability and quality of service • Fewer places for failure improve mean time between failures and reduce unplanned downtime.
Blades feature remote monitoring.	• Reduces travel to remote locations for service • Saves administrator time by eliminating tasks performed within the data center • Helps avoid unplanned downtime outside of business hours

Tools to help you collect data

HP provides a variety of tools and services available from your account representative or HP partner to help you outline and compare the TCO of different options. There are also a number of professional firms which undertake TCO analysis for a fee.

Quick BladeSystem TCA and TCO savings: This online tool creates a savings estimate based on your specific configuration needs and can be customized to match a variety of assumptions and configuration options.
www.hp.com/go/bladesystem/tcotool

Detailed BladeSystem TCO analysis: Contact your HP account manager or HP partner representative to discuss a complete TCO analysis or proof of concept.

IDC analysis of blade TCO: This report from IDC contains good data on blades as well as more details related to TCO.

Build your blade configuration: With this online tool, you can build a very precise technical configuration which also includes details for power, cooling and facilities planning. These details will help make an accurate TCA and TCO comparison.
www.hp.com/go/bladesystem/configurator

Techniques beyond TCO

While TCO spurs better dollars-and-cents thinking, it is really just a start. Technology tends to defy, rather than comply, with common-sense purchasing rules.

Reducing server and infrastructure costs does not necessarily increase return on investment. People who drive a cheap car often delude themselves into thinking they are frugal. But when the car breaks down and they lose money, time and opportunity, they obviously have not come out ahead.

What does this mean to an IT manager or financial decision-maker? It means the key for technologists—as always—is alignment. Costs alone mean nothing. What really matters is how your investments pay you back.

Here are several techniques beyond TCO that help you measure the financial attractiveness of any IT project.

Return on investment (ROI): How much profit or cost saving is realized. If your business has immediate objectives of winning a new account or adding new customers, getting market revenue share, positioning itself for sale, or other objectives, a return on investment might be measured in terms of meeting one or more of these objectives rather than in immediate profit or cost savings.

Payback period: The length of time required to recover the cost of an investment. It can be calculated by dividing the cost of the project by the annual cash inflows that result. All things being equal, a shorter payback period is the better investment.

Net present value (NPV): A standard method for the financial appraisal of long-term projects. It measures the excess or shortfall of cash flows, in present value (PV) terms, once financing charges are met.

Internal rate of return (IRR): A capital budgeting metric used to decide whether or not to make investments. It is an indicator of the efficiency of an investment (as opposed to NPV, which indicates value or magnitude). You can think of IRR as the rate of growth a project is expected to generate. Generally speaking, the higher a project's internal rate of return, the more desirable it is.

HP Services to enhance business outcomes

HP BladeSystem portfolio core service options help cost-effectively plan, build, and manage an optimized blade environment. Delivered in collaboration with our authorized service partners, these simple, affordable, and reliable HP Care Pack offerings will support your IT lifecycle needs:

Deployment Services

Deploying new equipment and technologies can mean higher productivity, faster time-to-market, and more efficient operations. But if your IT organization is already working at capacity, change can bring serious resource issues, complex configuration and integration challenges, business interruptions, and customer-service shortfalls.

A complete portfolio of proven deployment solutions:

HP Factory Express: A wide array of factory-customized, factory-configured, and factory-integrated solutions ready-to-roll at your site.

Onsite Installation: An HP-certified engineer conducts basic installation and turn-on of your hardware and software products.

Onsite Installation and Startup: In addition to basic hardware and software installation activities, an HP-certified engineer manages the installation, advanced configuration, and turn-on of more complex solutions.

Custom Deployment: Professional project management, setup and coordination of services for more complex, multivendor initiatives where traditional deployment models do not provide the flexibility required to meet specific customer needs

HP Support Plus 24 helps you increase performance and availability with comprehensive, integrated consistent hardware, and Insight Control software technical support services. Working with your IT team, HP Services engineers deliver onsite hardware support, and over-the-phone software support around-the-clock 365 days per year. Service includes HP Insight Control license to use software updates, plus software product and documentation updates.

HP Financial Services

HP Financial Services makes it easy for you to intelligently and economically manage business technology investments. Leasing affords companies the opportunity to expand or renew IT infrastructure, independent of budget cycles. As a partner, we develop flexible solutions that address your business needs and fit within your budget.

HP Services benefits

HP Services combines the technical insight and expertise of our 69,000 service professionals with the breadth of the entire HP portfolio to deliver solutions tailored to precise mid sized business needs. We supplement our own Services team with a carefully selected network of authorized channel partners. This provides a fuller set of services anywhere you do business—no matter how remote the location. Our service professionals across the globe are focused on a single goal: driving the success of business by addressing the customer's unique technology challenges. By working closely with the business to identify the right sourcing model or services engagement from our full lifecycle of capabilities, we can quickly and cost-effectively achieve results. Together our goal is to help you reap cost and productivity benefits from your HP BladeSystem infrastructure.

- Gain greater performance from your HP BladeSystem investment
- Increase system utilization rates
- Improve productivity

Summary

Ultimately, determining the TCO of any project depends upon careful research of all variables, not just the initial purchase cost. In almost all cases, the TCO of any IT purchase will greatly exceed the initial purchase price within the first five years. These costs were top-of-mind for HP engineers when they designed the HP BladeSystem. Savvy financial decision-makers carefully research their server investments by conducting power, performance and reliability tests and pilot programs of new hardware and software before making a purchase. With a comprehensive TCO analysis, your organization can better track its spending and make accurate budget projections. If at the end of your analysis you choose to adopt blades, you are not merely making a choice about servers, but a commitment to fundamentally improve the cost structure across your entire infrastructure.

Additional resources

To connect with other blade customers, partners and experts, visit the HP Blade Connect online community **www.hp.com/go/bladeconnect**

To learn more about HP BladeSystem, visit **www.hp.com/go/bladesystem**

To see what a bladed application environment may look like: **www.hp.com/go/bladesolutionexamples**

Appendix A: Sample configurations

Table 6. Sample server assumptions configuration

	BL460c server	1U Intel® server
Processors	Two 2.33 GHz quadcore 1,333 FSB	Two 2.33 GHz quadcore 1,333 FSB
Memory	HP 2 GB FBD PC2-53000 2x1	HP 2 GB FBD PC2-53000 2x1
HDD	72 GB 15K SAS 2.5 HP HDD	72 GB 15K SAS 2.5 HP HDD
SAN	HP BLc QLogic QMH2462FCHBA Optional Kit	PCIe dual-channel FC HBA
Storage controller	Included in base unit	HP E200i Controller
NICs	Included in base unit	NC373T PCIe Multifunction
Redundant power and cooling	Included in base enclosure	Redundant supplies and fans
Cost per server	$5,427	$5,876

Table 7. Other assumptions for configuration

Other assumptions	
Cost per square foot	$62.50
Data center port cost	$450
Edge switch port cost	$287
Electricity cost	$0.10 per KWh
Ethernet cable cost	$25
FC cable cost	$103
SFP cost	$199
Server operating hours	8736
Cooling factor	1
Years for power and cooling	3

To learn more, visit www.hp.com/go/bladesystem

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