Hyperconverged Platforms: ROI for the Mid-Enterprise

Business Value of the HPE Hyper Converged 250 System with VMware vSphere®

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Contents

Executive Summary

Enterprises are looking to innovations like big data, cloud-based services and mobile apps to improve decision making and accelerate business results. But legacy IT implementations—independent compute, storage and networking platforms, veneered with a hypervisor— often can't deliver on the increased agility, scalability and price-performance demands of this new era of IT.

Many IT organizations are considering hyperconverged infrastructure solutions to eliminate IT cost and complexity. Next-generation hyperconverged infrastructure platforms promise to transform IT economics and service agility by consolidating compute, storage and networking resources into compact x86 building blocks that are highly virtualized and uniformly administered. Market research firms project sales of hyperconverged systems to grow over 100% annually throughout the remainder of the decade and beyond.

This report explores the customer requirements and technology trends driving hyperconvergence adoption. It reviews the functional capabilities and business benefits of next-generation hyperconverged infrastructure platforms in general and the [HPE Hyper Converged 250 System](#) in particular. If your organization is a midsize enterprise (500 to 5000 employees) this report can help you decide:

- Does hyperconvergence offer better economics than our current rack-based, siloed environment?
- Would fully integrated, preconfigured hyperconverged platforms better serve the business?

We examine these questions by comparing HPE's hyperconverged infrastructure platform with a conventional siloed infrastructure based on standalone compute, storage and storage area networking platforms. **After analyzing the total cost of ownership (TCO) for both approaches Porter concludes the HPE Hyper Converged 250 System offers a rapid return on investment (ROI) and substantial incremental business value especially in the critical areas of IT efficiency, user productivity and time-to-solution.**

Introduction - Can Hyperconvergence Live up to the Hype?

Hyperconvergence is unquestionably one of the hottest trends in IT. The technology promises to reduce TCO and improve IT agility by collapsing silos and streamlining operations. But is hyperconverged infrastructure *decidedly* more efficient and cost-effective than traditional IT infrastructure? Do the business advantages and financial returns *markedly* outweigh the costs and risks of introducing a new technology? Porter Consulting took a hard look at HPE's latest hyperconverged infrastructure platform to find out.

This report explores in detail a TCO analysis for the HPE Hyper Converged (HC) 250. We examine the direct costs and hidden opportunity costs of the system to evaluate its full business potential compared to a conventional data center implementation based on distinct compute, storage and SAN platforms. Unlike "bare metal" infrastructure, the HC 250 solution includes VMware vSphere and so is "ready to go."

The report is intended for executives and IT planners who are investigating hyperconverged infrastructure solutions and are trying to quantify their real-world costs and benefits. The paper is aimed primarily at midsize enterprises (the primary market for the HPE HC 250), but the general concepts described apply to smaller businesses or larger enterprises as well. We hope to demystify hyperconvergence and present a fact-based business case for adopting the new technology.

One of our specific goals is to help IT professionals and decision makers understand the advantages of hyperconverged infrastructure platforms like the HC 250 compared to a "build-your-own" approach with separate servers and virtual storage solutions. In addition to examining typical TCO attributes like CAPEX and OPEX, we explored less obvious, yet more meaningful benefits like IT efficiency and user productivity to assess the overall business value of the solution. Soft benefits such as these are typically more impactful than "spec-level" considerations such as power, cooling and rack space savings. To that end, we examined how the efficiencies of HPE's hyperconverged solution deliver:

- **Improved business agility** – faster delivery of new business applications, for greater revenue and increased customer satisfaction.

- **Increased employee productivity** – faster access to new applications and IT services, with higher service and availability levels.

- **Greater IT efficiency** – IT personnel spend less time designing, building and maintaining mundane infrastructure and more time working on strategic initiatives to grow the business.

We used HPE's Converged Infrastructure Business Value Calculator tool for parts of our analysis.

Hyperconvergence Business Drivers

Advances in technology—the commoditization of increasingly powerful multicore x86 servers, the widespread adoption of virtualization solutions like VMware, the growing popularity of distributed computing frameworks like Hadoop®—are transforming the way organizations deliver, process and consume data. Enterprises are implementing cloud-based services and agile development practices to improve time-to-market, accelerate the pace of IT and contain costs. And business leaders are looking to innovations like big data, analytics and IoT to improve decision making, increase automation and bolster business results.

Legacy IT environments, originally architected to support conventional business applications, are too costly, complex and inflexible for today's dynamic service environments. Many enterprises are held back by disjointed IT infrastructure—autonomously managed silos of independent compute, storage and networking resources—each
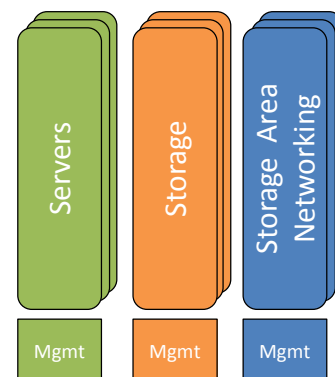

Figure 1: Siloed Infrastructure is Inherently Costly and Inefficient

funded only for a specific business application.

These fractured implementations are inherently costly to operate—each platform consumes power, cooling and rack space. And when taken together, they are fundamentally difficult to configure and manage—each platform supports a unique administrative interface and requires special training and expertise. In addition, IT organizations often purchase server, storage, SAN and networking solutions from different vendors, complicating product procurement, licensing and support arrangements.

Siloed IT architectures are also notoriously complex to extend and support. Data centers are routinely overprovisioned to support future requirements—an inefficient approach that squanders capital. Rolling out a new application, expanding capacity or supporting a new business initiative can be a manually intensive, error-prone proposition involving a number of different technology platforms, administrative interfaces and operations teams. Deploying new systems, provisioning storage and server resources, can take days or even weeks, and involve application, storage and networking specialists. Troubleshooting problems can be just as difficult and time-consuming. **In our view, the legacy data center has become a barrier to innovation, rendering IT unable to respond to the needs of the business in a timely fashion.**

The New Era of IT Requires More Agile and Scalable Infrastructure

Going forward, enterprises must revamp data center infrastructure for the new era of IT. Contemporary applications—big data and analytics, VDI, IoT, DevOps, XaaS—demand a more adaptable, scalable and affordable IT framework. To deliver a competitive advantage to the business, the next-generation data center must:

- Allocate and adjust compute, storage and networking resources in real-time to support on-demand applications, dynamic workloads and elastic services.
- Enable simple, cost-effective scalability to accommodate evolving business requirements and skyrocketing data growth.
- Meet strict availability requirements and SLAs for business-critical applications and always-on services.
- Offer a granular, invest-as-you-grow model that closely aligns CAPEX and OPEX with business demands.

Hyperconverged Infrastructure Business Benefits

Next-generation hyperconverged infrastructure platforms are designed from the ground up to meet the increased price-performance, scalability and agility demands of the cloud first, mobile-first world of IT. Porter believes hyperconverged platforms are well suited for today's data-intensive applications and dynamic services. And they are extremely cost-effective for traditional business applications as well.

Hyperconverged platforms eliminate infrastructure cost and complexity by collapsing disaggregated technology silos into uniform, storage-rich, highly virtualized, x86 building blocks that are managed in a unified fashion from a single administrative interface. They bring web-scale economics and enterprise-class availability to virtualized applications, taking the concept of simple to manage resource pools to the next level. What was once

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the domain of very large service providers is now available to any business regardless of size or industry.

Hyperconverged systems are particularly well suited for unattended sites such as remote/branch offices and colocation facilities. Delivered as self-contained building blocks, hyperconverged platforms can be installed and expanded by IT generalists. Most hyperconverged solutions support VM-centric, remote management tools that eliminate the need for dedicated on-site server and storage specialists for routine adds, moves and changes.
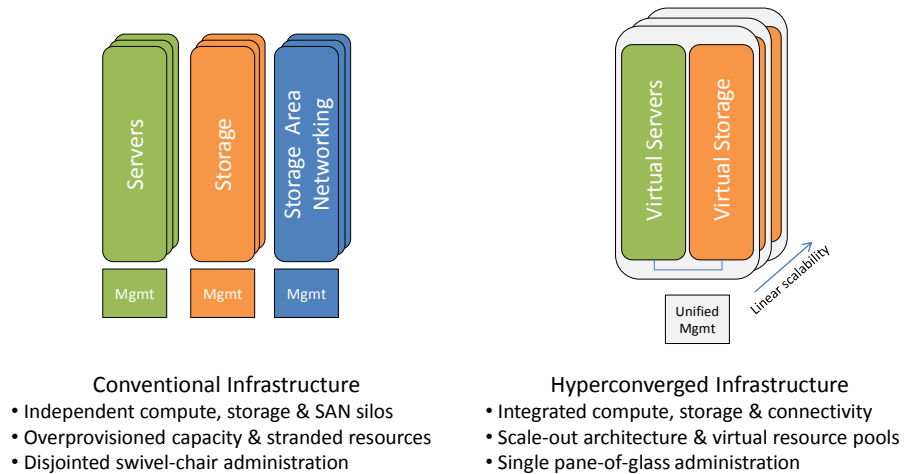

Conventional Infrastructure
- Independent compute, storage & SAN silos
- Overprovisioned capacity & stranded resources
- Disjointed swivel-chair administration

Hyperconverged Infrastructure
- Integrated compute, storage & connectivity
- Scale-out architecture & virtual resource pools
- Single pane-of-glass administration

Figure 2: Hyperconvergence Eliminates Infrastructure Cost and Complexity

Hyperconvergence offer a variety of business benefits compared to conventional siloed approaches, including:

<u>Greater flexibility and responsiveness</u>

- **Rapid deployment, expansion and time-to-value** – with a building block approach that eliminates resource intensive, time-consuming system planning, engineering and integration tasks.

- **Increased service agility** – with virtual resource pools for service elasticity and unified management for rapid configuration, automation and administration.

- **Radical operations simplification** – by eliminating the need for dedicated server, storage and networking specialists, streamlining vendor interactions (one "throat-to-choke" for product procurement, maintenance and support) and containing IT sprawl.

- **Improved business innovation** – by freeing up IT personnel to focus on strategic business initiatives.

Better economics

- **Linear scalability** – with a modular product architecture that minimizes upfront investments, eliminates overprovisioning, and tightly aligns capital outlays and operations expenses with business requirements.

- **Lower CAPEX** – by consolidating compute and storage, eliminating separate SANs and reducing external Ethernet switching requirements (with internal server-to-server interconnects).

- **Lower OPEX** – by reducing recurring power, cooling, rack space and administrative expenses, and curbing product licensing and maintenance fees.

The bottom line: hyperconverged infrastructure enables IT to respond to the needs of the business more quickly, efficiently and cost-effectively.

Hyperconvergence Offers Advantages Above and Beyond Build-Your-Own

Many midsize companies have the talent to design and build out next-generation infrastructure on their own. The question is not can they do it, but is it the best use of their time and energy? Sizing systems, installing software, configuring compute and storage resources can be a resource intensive, time-consuming proposition.

Porter believes the hyperconverged infrastructure approach offers better business value than the build-your-own approach (see table below). A hyperconverged platform can help IT organizations simplify system integration, operations and logistics; accelerate time-to-value; and free up valuable IT resources to focus on business innovation.

Attribute	Relative Cost/Complexity	
	Build-Your-Own Solution	**Hyperconverged Solution**
Servers and storage	Med - Rack servers and virtual storage	Low - Factory integrated compute and virtual storage
Storage networking	High - External SAN (with virtual storage appliance approach)	Low - Integral connectivity
System administration	High - Disjointed admin (unless sourced from one vendor)	Low - Unified administration
System planning	High - Manual planning, integration and configuration	Low - Uniform, pre-configured building blocks
Support and vendor logistics	High - Multiple vendor/support interactions	Low - Single vendor/support interactions

Converged 250 System Overview

The HC 250 is HPE's latest hyperconverged infrastructure platform. Intended for midsize enterprises, the product combines compute, highly available storage, hypervisor, and management capabilities into a single, 2U scale-out appliance. All hardware and software components, including VMware vSphere, are factory-installed and pre-integrated.

The HC 250 incorporates HPE ProLiant Gen9 x86-based server technology, HPE software-defined storage technology and VMware vSphere hypervisor technology. Each 2U chassis supports up to four server nodes. Up to 32 server nodes can be clustered together as a system and managed from the same console. The product features a wizard-driven startup program that simplifies deployment and expansion (HPE claims the product can be deployed in under 15 minutes). Day-to-day operations such as creating VMs and configuring resilient virtual storage pools (datastores) are performed using the HPE OneView for VMware vCenter™ management application. HPE asserts the HC 250 can be managed by IT generalists and does not require any specialized storage, server or virtualization expertise.

The HC 250 supports transparent VM failover across nodes, systems and sites for business continuity. Data backup and recovery is supported via storage-based snapshots and HP Remote Copy integration with virtualization platforms and Microsoft Windows® applications.

For detailed product information consult the HC 250 QuickSpecs.

HC 250 TCO and ROI Analysis

Porter analyzed the ROI for the HC 250 for a typical midsize business with annual revenues of $10 million USD. We compared the initial and ongoing costs of the hyperconverged solution with the ongoing costs of an incumbent solution made up of discrete servers, storage systems and SAN switching platforms.[1] We assumed a system with 100 VMs and 20GB/VM of storage, with 2 vCPUs and 4GB RAM allocated per VM. Using HPE's Converged Infrastructure Business Value Calculator tool, we compared the direct and indirect costs of both solutions as detailed below.

Direct costs

- **Hardware** – the initial capital equipment costs of the HC 250, assuming a 30% discount off U.S list. (We assumed the incumbent hardware was paid off.)

- **Software** – the initial software licensing fees of the HC 250. (The costs happen to be zero, because HPE does not impose software license fees for the CS 250-HC.)

- **Services** – optional HPE on-site "start-up" installation and configuration services fees for the new solution. (Assumes a 30% discount.)

- **Support** – annual maintenance fees for both solutions (Assumes annual support costs equal 15% of initial investment. Legacy solution includes separate server, storage and networking equipment support fees)

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[1] HP ProLiant BL460c servers, HP StorageWorks EVA6000 storage and Brocade SAN switching platforms

- **Power** – ongoing electrical expenses for both solutions. (Assumes $.10 per kWh.)
- **Data center infrastructure** – ongoing real estate costs for both solutions. (Assumes $300 per square foot.)

Indirect costs

- **IT staff efficiency** – represents ongoing VM administrative expenses.[2] (Assumes $44/hr. for burdened IT admin costs.) The HPE OneView for vCenter application simplifies VM adds/moves/changes reducing recurring operational expenses for the hyperconverged solution.
- **User productivity** – opportunity costs associated with employee idleness due to application deployment, support and downtime.[3] (Assumes $29/hr. for burdened business-user costs.) The hyperconverged system improves user productivity by offering inherently faster virtual server and application installation and configuration; inherently faster and less-disruptive virtual server and application upgrades and changes; and inherently higher system uptime.
- **Time-to-solution** – the opportunity cost of delaying the IT refresh.[4] (Assumes the hyperconverged solution results in 5% revenue growth and company profits equal 20% of revenues.)

TCO and ROI Findings

Table 1 summarizes the cumulative three-year TCO for both the incumbent and hyperconverged solutions. **The HC 250 offers substantial *absolute* costs savings especially in the areas of support, IT efficiency, user productivity and time-to-solution.** These savings are achieved largely by reducing upfront capital equipment expenses (which drive support pricing), simplifying ongoing system administration and operation tasks, and increasing system uptime and application availability.   Overall, the hyperconverged solution delivers a 66% TCO savings over the three year period.

Table 2 summarizes the key financial results for the new solution including the ROI, net present value (NPV) and payback period. **The HC 250 pays for itself in just eight months, and yields a 408% investment return in three years.** The rapid payback is achieved largely through support, IT efficiency and user productivity cost savings compared to the incumbent solution. Appendix A explains the Table 2 financial metrics.

In today's standards-driven marketplace of Intel processors and commodity disk / flash storage, we see limited and fleeting "hardware" advantages for any vendor. Cost

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[2] IT staff efficiency is expressed as an opportunity cost. Annual IT admin savings are compared to a non-integrated legacy solution assembled by the customer. They are assumed to be 27 hours/VM and 8.9 hours/VM for the incumbent solution and hyperconverged solution, respectively, based on HPE-commissioned research performed by the Enterprise Research Group. The opportunity cost contribution is conservatively calculated at 20% of the estimated expenses.

[3] Application deployment, support and availability savings for the hyperconverged solution are assumed to be 42 hours/VM, 48 hours/VM and 56 hours/VM, respectively based on HPE-commissioned research performed by the Enterprise Research Group.   The opportunity cost contribution is conservatively calculated at 20% of the estimated expenses. The model assumes 40% employee efficiency, i.e. employees are productive only 40% of active hours.

[4] The opportunity cost is calculated at 40% of the estimated expenses.

savings and incremental productivity and revenue accrue from faster time-to-value, improved operational efficiencies and higher availability. Providing the entire VM management stack "out of the box" reduces staff effort and accelerates time to value.

	Incumbent Solution	HPE HC 250	Absolute Savings	Percent Savings	Comments
DIRECT COSTS					
Hardware	$0	$93,832	-$93,832	0%	Cost of new systems
Software	$0	$0	$0	0%	HPE does not charge separately for software
Services	$0	$2,456	-$2,456	0%	Optional deployment services
Support	$86,862	$13,731	$73,131	84%	Lower maintenance fees
Power	$10,823	$6,915	$3,908	36%	More compact and efficient form factor
DC Infrastructure	$2,846	$1,427	$1,418	50%	More compact and efficient form factor
INDIRECT COSTS					
IT Efficiency	$123,730	$82,812	$40,917	33%	Faster, more efficient planning, deployment, operations
User Productivity	$252,534	$0	$252,534	100%	New revenue through faster time to deployment, lower cost through less employee downtime and revenue loss
Time to Solution	$119,589	$2,300	$117,290	98%	Opportunity cost lost to delayed refresh
TOTAL	**$596,383**	**$203,473**	**$392,910**	**66%**	
TCO per VM	$5,964	$2,035	$3,929	66%	

Table 1: Cumulative Three-Year TCO

ROI	408%
Net Present Value	$367,105
Payback Period	8 Months

Table 2: Investment Return Analysis

Conclusion

Conventional siloed IT implementations can't meet the increased agility and scalability demands of the cloud first, mobile-first world of IT. Hyperconverged infrastructure platforms like the HC 250 eliminate IT inefficiencies and complexity by consolidating compute and storage resources into highly virtualized, uniformly administered x86 building blocks. Preloaded VMware software is an added bonus. The hyperconverged approach enables IT to respond to the needs of the business more quickly and cost-effectively.

After analyzing the functional capabilities and financial characteristics of the HC 250, Porter believes IT organizations can gain substantial business benefits by migrating incumbent IT systems to hyperconverged infrastructure, including:

IT Efficiency

- **Accelerated IT agility** – scale-up capacity and add-users on-demand.
- **Lower administrative costs** – simplify system planning, configuration and support tasks.
- **Lower operating costs** – reduce power, cooling and rack space requirements.
- **Simplified logistics** – interact with a single vendor for procurement, maintenance and support.

User Productivity

- **Faster time-to-value** – rollout new applications and services more quickly.
- **Greater user productivity** – deliver consistently higher IT service and availability levels.
- **Improved business focus** – free up IT staff for strategic business activities.

When evaluating the business case for a hyperconverged solution, Porter strongly recommends IT organizations consider the indirect costs discussed in this report. **We believe significant costs savings in the critical areas of IT efficiency, user productivity and time-to-solution will enable a rapid investment return.** The particular customer scenario analyzed in this report provides a strong business case for the HC 250 with a quick payback period of just eight months.

Appendix: ROI Terminology

Net Present Value

NPV is the difference between the present value of the future cash flows derived from the HC 250 investment and the cost of the investment. A discount rate of .76 is assumed for the calculation.

Payback Period

Payback period indicates when the customer will start to see a positive return on the HC 250 investment. It examines savings benefits accrued over time and costs incurred over time to determine the investment's breakeven point (in months).

Return on Investment

ROI is a profitability ratio for the HC 250 investment. It is calculated by dividing the total savings of the hyperconverged solution by the upfront investment expenses (initial hardware, software and services costs).