



White Paper

Analyzing the Economic Value of HPE ConvergedSystem 700 in Enterprise Environments

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Introduction

Executive Summary

ESG was engaged by HPE to develop a detailed economic analysis for HPE ConvergedSystem 700; the analysis is designed to help IT organizations at larger enterprises determine the potential relative costs and benefits of leveraging its pre-engineered ConvergedSystem 700 compared with a “present mode of operation” (PMO) that reflects either traditional built-by-customer virtual infrastructure based on discrete components or other converged and reference architecture approaches to infrastructure (alternative integrated systems). This analysis builds upon ESG’s evaluation of ConvergedSystem 700, in-depth interviews with technical stakeholders at HP, ESG qualitative and quantitative market research with converged infrastructure customers, and ESG’s general familiarity with converged infrastructure products currently available in the market. This analysis is designed to provide potential customers with a comprehensive picture of the potential direct and indirect cost and benefit drivers they should consider when evaluating a HPE ConvergedSystem 700 investment.

As discussed in the following pages, HPE ConvergedSystem 700 offers the opportunity for enterprise organizations to drastically increase their IT and user productivity at a significantly lower TCO compared with alternative infrastructure virtualization approaches. In fact, ESG’s analysis of a typical use case for HPE ConvergedSystem 700 results in an impressive 315% ROI. Comparative approaches to infrastructure virtualization which ESG modeled resulted in significantly lower ROIs as a result of the combination of both higher total costs of ownership and lower benefits. For organizations struggling to overcome IT operational challenges tied to infrastructure complexity, embracing the automation and intelligence offered by today’s integrated computing platforms can prove invaluable. Virtual computing solutions that are faster to deploy, easier to manage, and that automatically react to change, as well as predictably expand and contract based on business requirements, as shown in ESG’s analysis, can have a significant impact on the financial success of enterprises.

Market Overview

The Increasing Usage of Integrated Computing Platforms (ICP)

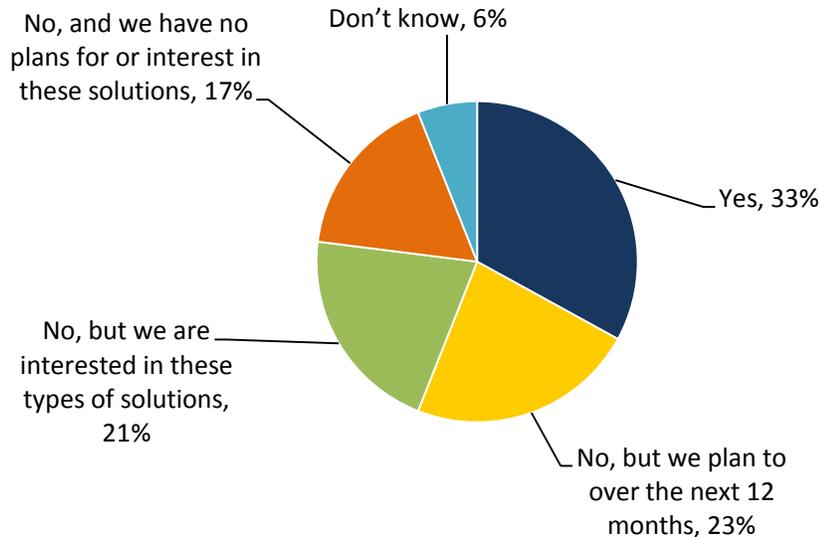
The value of consuming infrastructure that is preconfigured and validated is building momentum within the IT community. Though IT can build a workable virtual computing infrastructure by piecing together separate point components designed and delivered in isolation, the added degree of system integration required in highly virtualized data centers focusing on private cloud or IT-as-a-service models has begun to transition IT procurement strategy away from do-it-yourself (DIY) virtual computing infrastructure and toward integrated computing platforms. These solutions consist of tightly integrated converged systems that encompass servers, networking, and storage infrastructure plus virtualization and intelligent management software—all designed, tested, qualified, and supported as a single unit.

In order to assess the pace of adoption, ESG asked IT decision makers about their organizations’ usage of or interest in integrated computing technology, defined as platforms in which servers, storage, network connectivity, and (in most cases) software are combined in a single solution. According to Figure 1, one-third of respondent organizations have already deployed integrated computing platforms, while an additional 44% have plans for or interest in these types of solutions.¹

¹ Source: ESG Research Report, [Trends in Private Cloud Infrastructure](#), April 2014.

Figure 1. Usage of Integrated Computing Platforms

Does your organization currently use any type of integrated computing platform?
(Percent of respondents, N=303)



Source: Enterprise Strategy Group, 2014.

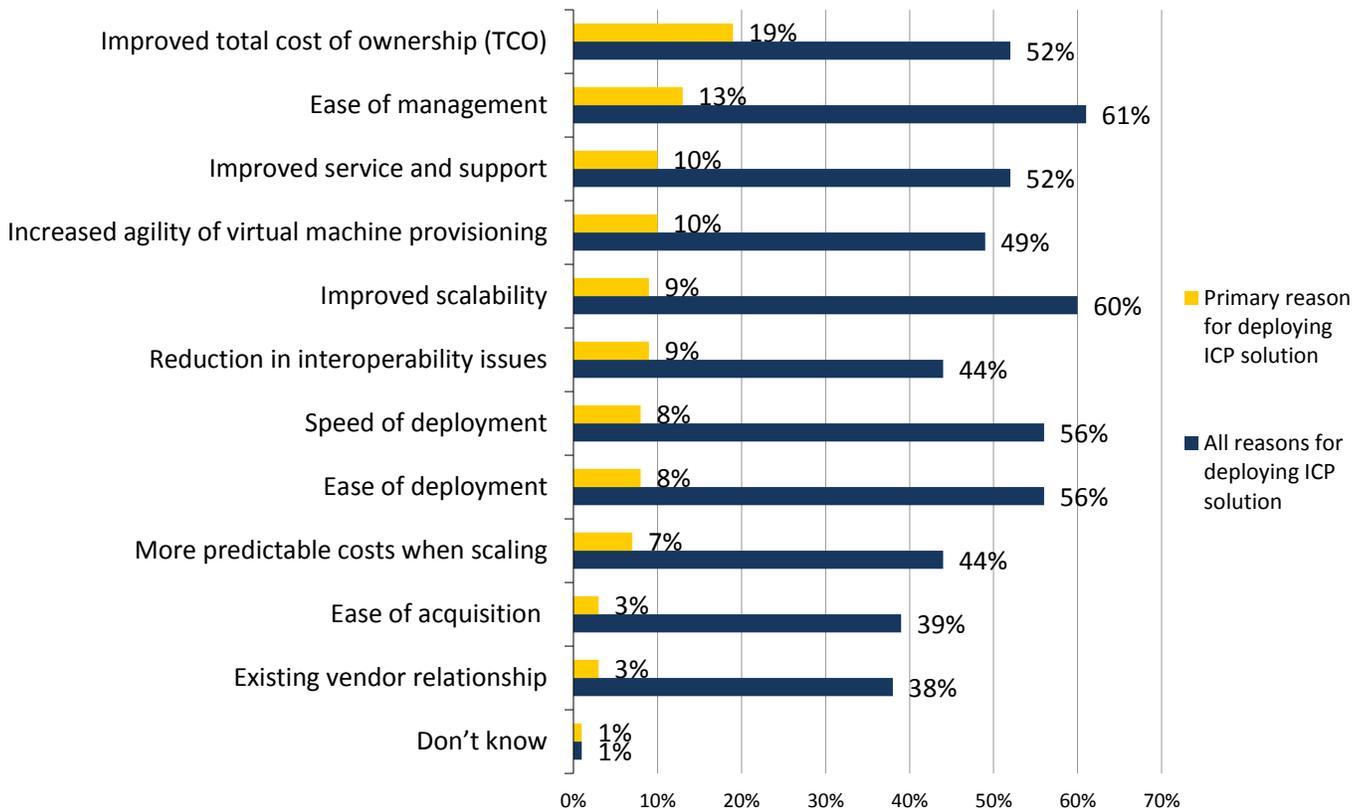
Further inspection of the investments IT organizations are making in these systems reveals that there is a strong correlation between private cloud deployments and integrated computing platforms. Specifically, organizations that have already deployed a private cloud infrastructure are nearly twice as likely to be current integrated computing platform users (compared with organizations that have not yet deployed private cloud infrastructure).

IT Operational Efficiencies and Economics Drive Investment

While the correlation between private cloud deployments and integrated computing platforms was clear in the data, ESG sought insight about the causes of those ICP investments more explicitly. ESG asked respondents to identify their organization's reasons for investing in integrated computing platforms and, as the data shows, improvements in deployment and management processes are among top drivers for integrated computing platforms. More than half of current and potential users of these solutions cite ease of ongoing management, improved scalability, reduced deployment times, and simplified initial implementations as adoption drivers (see Figure 2). When pressed to identify the *primary* reason behind integrated computing platform deployment decisions, nearly one in five current and potential users singled out improved total cost of ownership. In spite of the existence of perceptions that integrated computing platforms require more significant capital outlays than procuring compute, networking, and storage resources on a piecemeal basis, it appears that many organizations are looking at the bigger picture and realizing the potential impact these solutions can have in terms of improved time to value and operational efficiency.

Figure 2. Reasons for Deploying/Planning to Deploy Integrated Computing Platforms

Which of the following factors drove your organization to deploy – or consider deploying – an integrated computing platform(s)? What would you say was the primary reason that you deployed – or are considering deploying – an integrated computing platform(s)? (Percent of respondents, N=234)



Source: Enterprise Strategy Group, 2014.

HPE ConvergedSystem 700 Overview

HPE ConvergedSystem 700 with VMware vSphere represents the latest development of HPE Converged Systems. A quick look at the specs of the HPE ConvergedSystem 700 reveals the consistency this system has with the demands of business critical applications in enterprise environments. The system is powered by Intel Xeon processors and is comprised of 2 HPE Virtual Connect Flex Fabric 10/24-port Module for c-Class BladeSystem, HPE 3PAR StoreServ 7200 and HPE ProLiant BL460c Gen9 E5-v3 servers.

The solution is based on a modular design and can scale both vertically and horizontally, enabling IT to add capacity based on need without requiring entirely new systems. Scalability is a key value for HPE as customers make an initial investment with plans to potentially build upon the foundation. The base HPE ConvergedSystem 700 configuration includes four blade servers and 36 300 GB 15k drives (10.8 TB). This configuration allows for expansion with single server granularity. The ConvergedSystem 700 maxes out at 128 blade servers and 1,920 drives (576 TB assuming 300 GB 15k drives).

In an effort to build upon the operational value of integration, HPE ConvergedSystem 700 is factory installed with HPE OneView management software, vSphere Operations Manager 5.5 update 2, and vCenter with Operations Manager 5.5 update 2. This tightly integrated software package enables customers to quickly configure the system when it arrives onsite and efficiently begin to power on virtual machines.

HPE ConvergedSystem 700: Economic Value Analysis

Methodology

For this project, ESG adhered to the following research and modeling methodology:

- ESG conducted initial market research across HPE and other relevant IT vendors to assess current market trends, vendor value claims, and the purchase considerations that are most important and relevant to existing and prospective virtual computing infrastructure customers.
- Based on the results of this initial research, ESG subsequently:
 - Identified two “present modes of operation” (PMOs)—effectively, alternative approaches that customers may take to meet their virtual infrastructure requirements—against which the costs and benefits of utilizing HPE ConvergedSystem 700 was to be compared.
 - A conventional built-by-customer infrastructure based on a combination of individually selected, tested, and integrated compute, storage, and network components.
 - A blended average of integrated systems and reference architecture infrastructure offerings of suitable scale for enterprise environments.
 - Developed a comprehensive financial model designed to qualify and quantify the potential costs and benefits of utilizing HPE ConvergedSystem 700 compared with both a conventional piecemeal virtual computing infrastructure approach and the utilization of a composite of competitive converged platforms.
- ESG then conducted a series of in-depth interviews with systems engineering, service and support, and technical marketing representatives from HP. The data collected in these interviews was used to refine assumptions built into the model related to current customer environments and the direct and indirect costs and benefits attributable to both HPE ConvergedSystem 700 and alternative virtual computing delivery approaches. Product demonstrations, configurators, and case studies of HPE ConvergedSystem 700 were also used to identify specific IT tasks and the labor burden (in both time and cost) associated with those tasks. These findings were then compared against the results of ESG’s qualitative and quantitative market research with organizations currently using integrated systems (inclusive of HPE and other vendors). This research helped to inform ESG’s understanding and analysis of integrated computing adoption drivers, usage trends, and the technical, operational, and financial benefits that have been realized by customers.
- Once the economic model was finalized and all validation was complete, ESG modeled a default scenario that is designed to demonstrate the relative costs and benefits of HPE ConvergedSystem 700 in a hypothetical enterprise environment. Those results were then compared with model outcomes for a similar-scale traditional virtualization solution based on separate compute, storage, and network components and a composite alternative integrated system. The results for this default scenario are described in the remainder of this paper.

Please note that the data and conclusions presented in this report regarding the costs and benefits associated with implementing HPE ConvergedSystem 700 in an enterprise environment compared with alternative virtualization solutions reflect the output of ESG’s economic value analysis based on the specific use case and default scenario assumptions modeled for this report. ESG acknowledges that changes to these assumptions will lead to a different set of results and as such, advises IT professionals to use this report as one validation point in a comprehensive financial analysis process prior to making a purchase decision. HPE provided current standard pricing information for HPE ConvergedSystem 700 to ESG. Other IT equipment and labor cost assumptions were obtained from publicly available sources such as IT vendor and channel partner websites and published price lists.

Economic Value Model Overview

As previously noted, ESG's economic value analysis compares three scenarios: The first is an organization that elects to use HPE ConvergedSystem 700 for its virtual compute infrastructure requirements. The second scenario is a "present mode of operation" (PMO) that reflects a more conventional "built-by-customer" approach that most customers currently take to meet their virtualization requirements. Finally, the third is a PMO that reflects a composite of alternative integrated systems available in market today. The basic profile for each scenario follow:

- **HPE ConvergedSystem 700 scenario:** In this scenario, the customer is using HPE ConvergedSystem 700—a factory-integrated, turnkey package that combines HPE servers, storage, networking, and management software components with VMware virtualization software, and tailored systems-management capabilities (delivered by HPE OneView) in a single configuration that is ready to be installed in a customer data center. ESG's model takes into account the purchase price of the system, VMware software and maintenance costs, and related IT labor costs for planning, ordering, implementing, administering the system, and training.
- **PMO scenario 1; built by customer:** In this scenario, the customer is using a comparable set of hardware and software components that are selected, installed, and configured manually by the end-user customer or a systems integrator on the customer's premises. ESG's analysis assumes that the customer is using blade servers and SAN storage, and that the configuration will be clustered using 10 GB Ethernet switches and networking interfaces for server interconnects within the cluster, for SAN storage, and for external access to the servers. ESG also assumed redundant network switches and interconnects for high availability. Comparable operating system, hypervisor, and systems-management software is also assumed in this scenario. ESG's model takes into account all hardware, software, and data center infrastructure costs associated with this solution, plus related IT labor costs for planning, ordering, implementing, ongoing environment administration, and training.
- **PMO scenario 2; alternative integrated system:** In this scenario, the customer is using an alternative integrated system or a pre-integrated reference architecture to meet its virtual computing needs. The alternative is based on a blended average of in-market alternatives provided either directly by IT vendors or through VARs as a reference architecture. ESG's model takes into account the purchase price of the system or pre-integrated components, VMware software and maintenance costs, and related IT labor costs for planning, ordering, implementing, administering the system, and training.

For all three scenarios, ESG modeled the costs and IT savings benefits associated with the following tasks:

- Planning and architecture/design tasks required to scope the solution and prepare for deployment
- Deployment tasks including initial installation and setup, plus periodic upgrades and ongoing maintenance activities
- IT administration tasks such as provisioning and configuring new virtual servers and applications
- IT administration tasks related to storage and network installation, configuration, provisioning, and management
- Change management tasks performed as new software is added to virtual servers, existing software applications are upgraded, virtual machines are migrated across physical server resources, and existing infrastructure components are upgraded or replaced
- Ongoing systems management activities performed by the system and personnel for monitoring system activity, taking actions, and reporting on system status
- Note that ESG's model considers both the current infrastructure needs and the expected growth of the environment over three years to size the configuration of the solutions considered at the outset of the three-year time horizon.

Simply put: ESG’s analysis estimates the likely cost and potential benefits of implementing and managing—according to the tasks outlined—both HPE ConvergedSystem 700 and alternative integrated and component virtualization solutions. More detail on the specific cost and benefit categories included in ESG’s analysis—plus assumptions related to technology or product usage—is included in the Appendix.

Cost Categories

This ESG analysis considers six cost categories: hardware, software, infrastructure, professional services, staff, and maintenance and support. The sum of these categories equals the total cost of ownership (TCO) of each solution, see the Appendix for full details.

Benefit Categories

This ESG analysis considers two primary benefit categories: IT efficiency savings and user productivity improvements delivered over a baseline formulated to be roughly representative of an organization utilizing non-virtualized infrastructure. The sum of these categories equals the total benefit of each of the three solutions, see the Appendix for full details.

Default Scenario

ESG developed a baseline profile of a hypothetical enterprise to illustrate the relative costs and benefits of HPE ConvergedSystem 700 compared with the two PMOs discussed throughout this report. For the purposes of this analysis, ESG tuned its assumptions to a static default scenario representing an enterprise-sized virtual environment consisting of 350 virtual machines. To account for the costs and benefits of both solutions as virtual environments grow, ESG created a three-year analysis and assumed that the organization would add virtual servers at a rate of 20-25% of their initial deployment per year over that time period. To model the impact of different virtual infrastructure solutions on application environments and, ultimately, end-user productivity, ESG also uses inputs related to the application profile of the hypothetical enterprise to calculate a blended average of the number of end-users potentially affected by administrative and application availability events. Key assumptions used in ESG’s default scenario are summarized in Table 1.

Table 1. Key Default Scenario Assumptions for Composite Enterprise

Parameter	Default Assumption
Initial number of virtual servers at deployment	350
Annual growth of virtual servers	20-25% annually (or 77 VMs)
Assumed percent of applications that meet heavy/moderate/light workload profile	10% / 40% / 50%
Typical number of users for applications meeting heavy/moderate/light workload profiles	150 / 320 / 650
Number of virtual machines per CPU core for applications meeting heavy/moderate/light workload profiles	.5 / 1 / 4
Average amount of storage per virtual machine	100 GB
Average annual burdened cost – typical IT administrator	US\$80,000
Average annual burdened cost – typical employee (application user)	US\$65,000
Time horizon of analysis	3 years
Cost of capital	15%
HPE ConvergedSystem for IaaS model in use (if applicable)	ConvergedSystem 700

Source: Enterprise Strategy Group, 2014.

Summary of Results

With the model parameters tuned to the default assumptions in Table 1, ESG’s analysis concludes that the net benefits of implementing an HPE ConvergedSystem 700 in an enterprise environment likely greatly outweigh the associated costs. Table 2 shows the modeled return on investment (ROI), project payback period, net present value (NPV), annual total cost of ownership (TCO), and annual benefit over the time horizon for an HPE ConvergedSystem 700 deployment compared with similarly sized component-based and alternative integrated system approaches. The following section details the most compelling findings from this analysis as they relate to both the costs and benefits associated with HPE ConvergedSystem 700 and how they differ from other virtual computing infrastructure approaches.

Table 2. Economic Value Summary, HPE ConvergedSystem 700 versus Alternative Virtualization Approaches

Scenario	Project ROI	Payback Period (years)	Net Present Value (NPV)	Annual TCO	Annual Benefit
HPE ConvergedSystem 700	315%	.65	\$882,770	\$218,791	\$907,349
Alternative integrated system PMO	112%	1.52	\$367,587	\$366,140	\$775,746
Built-by-customer PMO	31%	2.56	\$(61,906)	\$338,212	\$443,419

Source: Enterprise Strategy Group, 2014.

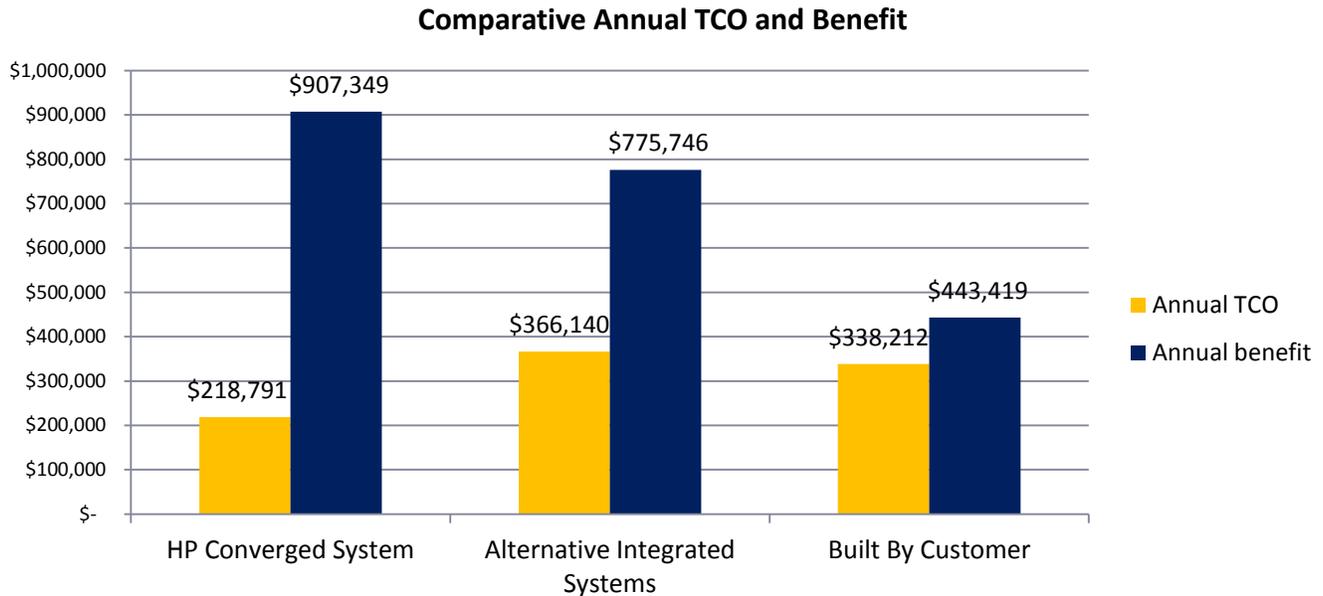
Annual TCO

Annual TCO is the sum of all the cost categories included in the analysis (as outlined in Table 5), averaged over three years. As displayed in Table 2, the annual TCO for HPE ConvergedSystem 700 is estimated as \$218,791, compared with \$338,212 for the built-by-customer PMO and \$366,140 for the alternative integrated system PMO. However, TCO should be only one part of the customer consideration when weighing available virtual computing approaches. As shown in Table 2—and discussed in the Annual Benefit section—the lower costs associated with HPE ConvergedSystem 700 are augmented by significant benefits in the area(s) of increased IT efficiency and improved user productivity.

Annual Benefit

Annual benefit is the sum of all the estimated benefit categories included in this analysis (as outlined in Table 6), averaged over three years. As displayed in Table 2, the annual benefit associated with HPE ConvergedSystem 700 is estimated as \$907,349, compared with \$443,419 for the built-by-customer PMO and \$775,746 for the alternative integrated system PMO. The modeled annual costs and benefits for all three scenarios is depicted graphically in Figure 3.

Figure 3. Annual TCO and Benefit, HPE ConvergedSystem 700 versus Alternative Virtualization Approaches



Source: Enterprise Strategy Group, 2014.

ROI

ROI is a profitability ratio for investments. It is calculated by dividing the net benefits of an investment (total benefits minus costs) by the total cost of the investment. A positive ROI indicates that total benefits exceed the costs of the investment. As displayed in Table 2, the modeled ROI for HPE ConvergedSystem 700 using the inputs defined in Table 1 is 315% (significantly higher than the ROIs calculated for either of the PMOs).

Payback Period

Payback period is an estimate of when customers will start to see a positive return from the virtual infrastructure solution they select; it measures benefits achieved over time and costs incurred over time and indicates the investment’s breakeven point. As displayed in Table 2, the expected payback period for an HPE ConvergedSystem 700 deployment in an environment described by the inputs in Table 1 is .65 years (about 8 months, significantly shorter than the payback periods estimated for either of the PMOs).

Net Present Value (NPV)

NPV is used to calculate the difference between the present value of cash returns and the present value of cash outflows. It assumes a discount rate to calculate the present value. Projects with positive NPVs are generally considered to be worthwhile investments. As displayed in Table 2, the modeled NPV for HPE ConvergedSystem 700 using the inputs defined in Table 1 is \$882,770 (significantly higher than the NPVs calculated for either of the PMOs).

Benefits Analysis

Potential customers evaluating modes of virtual infrastructure deployment must be cognizant of the benefits—in this analysis, broken down into IT efficiency savings and user productivity benefits—they will achieve from that technology solution. The three-year itemized benefits for HPE ConvergedSystem 700 compared with the PMO alternatives ESG developed are displayed in Table 3. As shown, total benefits for HPE ConvergedSystem 700 (estimated as \$2,722,047) are modeled as more than twice that of the built-by-customer PMO (estimated as \$1,330,258) and \$394,809 more than that of the alternative integrated system PMO (estimated as \$2,327,238).

Table 3. Three-year Benefits, HPE ConvergedSystem 700 versus Alternative Virtualization Approaches

Category	HPE ConvergedSystem 700	Alternative integrated system PMO	Built-by-customer PMO
IT efficiency savings	\$1,406,538	\$1,189,760	\$663,775
<i>Initial System Design, Integration, Deployment and Configuration</i>	\$126,948	\$86,417	\$51,102
<i>Systems Maintenance, Support, and Management</i>	\$216,031	\$205,773	\$63,646
<i>Resource Management Including Storage and Network Management</i>	\$641,813	\$490,510	\$383,031
<i>VM Administration</i>	\$421,746	\$407,059	\$166,077
User productivity	\$1,315,509	\$1,137,478	\$666,483
<i>Application Deployment</i>	\$463,477	\$463,387	\$252,838
<i>Application Support/Management</i>	\$189,112	\$135,039	\$81,038
<i>Application Availability</i>	\$662,920	\$539,052	\$332,607
Total three-year benefits	\$2,722,047	\$2,327,238	\$1,330,258

Source: Enterprise Strategy Group, 2014.

Major Benefit Differences for HPE ConvergedSystem 700 versus the Built-by-customer PMO

Benefits were calculated based on observations and estimates related to the value of HPE ConvergedSystem 700 and alternatives (represented by the PMOs) obtained through past ESG quantitative and qualitative research, relevant product demos, literature reviews, and in-depth interviews with technical stakeholders at HP. Key benefit differences between HPE ConvergedSystem 700 and the built-by-customer PMO are:

- In a component-based IT infrastructure, the burden of solution design and integration falls on IT. With HPE ConvergedSystem 700, the responsibility of planning, designing, and integrating the system resides entirely with HP. Moreover, HPE performs ~180 configuration tasks at the factory prior to delivery, which eliminates many onsite tasks such as IP address assignment, raw storage initialization, and some cabling. Additionally, HPE conducts an on-site product orientation with each customer for every ConvergedSystem 700 delivered. These advantages dramatically decrease implementation times for the customer. ESG estimates that many systems could be production-ready in as few as three to four weeks compared with several months for many build-your-own alternatives.
- With respect to the ongoing management and administration of physical resources, HPE ConvergedSystem 700 offers a higher degree of automation than what’s possible with conventional, build-your-own infrastructure. HPE OneView seamlessly integrates management and provisioning of servers, IP network, and SAN connectivity. Changes across all system components are automated and help to eliminate potential configuration errors and rework. Furthermore, HPE OneView exploits iLO capabilities for agentless discovery, monitoring, and change management such as BIOS settings. HPE OneView also includes built-in logic to show dependencies on pending changes, and prevents changes such as network or storage de-provisioning that would disrupt operations for system components. Finally, although infrequent, most systems will incur some hardware change events over their lifetime. With ConvergedSystem 700, hardware components can be easily replaced while the system remains operational. Redundant hardware and software architecture enables system availability and resiliency. The HPE system continues to operate while repairs are completed.

- With respect to the ongoing management and administration of virtual resources, HPE ConvergedSystem 700 also outstrips build-your-own-infrastructure scenarios. HPE OneView allows for template/automated provisioning and easy decommissioning of VMs. Furthermore, time required for change management tasks, including changing VM parameters, VM migrations, or updating guest OSES is reduced from hours to minutes.
- HPE ConvergedSystem 700's ability to decrease IT staff resources required for solution planning, design, and installation is measured directly as an IT efficiency benefit. However, this benefit does not occur in a vacuum. A significant benefit of reducing the time required to implement and provision virtual infrastructure—and thus the applications reliant on that infrastructure—is speeding time to value for those applications. This corollary benefit is captured and included in the “Application Deployment” benefit quantification in Table 3.
- A factory-integrated system such as HPE ConvergedSystem 700 is much less likely to have interoperability problems than a customer-integrated solution and is therefore more reliable over time. This benefit, coupled with the other reliability and error prevention features mentioned, has a profound impact on application end users and is a component of both the “Application Support/Management” benefits and the “Application Availability” benefits modeled for the organization over three years.
- The integrated monitoring and management capabilities of HPE ConvergedSystem 700 and HPE OneView are modeled to reduce the time required to identify and resolve issues, thereby reducing unplanned downtime. Moreover, HP's proactive support and the fact that HPE is the proverbial “one throat to choke” are modeled to lead to faster issue resolution and shorter system outages. Again, this benefit is a component of both the “Application Support/Management” benefits and the “Application Availability” benefits modeled for the organization over three years.

Major Benefit Differences for HPE ConvergedSystem 700 versus the Alternative Integrated System PMO

- Most alternative integrated systems in the market today are pre-configured and pre-packaged components from multiple vendors. HPE ConvergedSystem 700 differs from these alternatives because all components originate from HP. This allows HPE to offer converged support to complement its converged system. HPE support provides direct access to solution experts to resolve issues in the shortest time, and with single a point of contact. Moreover, HPE has a global call management footprint and globally dispersed field engineers. By contrast, with alternatives support issues may be escalated to any of a number of tiers or vendors, lengthening the time to resolution. ESG has modeled that with alternatives, there is a slightly greater opportunity for both setup and ongoing maintenance issues to arise and take longer to resolve.
- Another area of value for HPE ConvergedSystem 700 is the *proactivity* of its support. Included within HP's standard support for Converged Systems are proactive health checks and system recommendations. ESG has not observed any other integrated platforms which include this level of support in their base price. This differentiator is modeled to impact both administration activities and time spent troubleshooting issues.
- HPE OneView management features were a significant differentiator outlined in the built-by-customer PMO scenario, and they are also a differentiator in the alternative integrated system comparison because HPE OneView offers a richer feature set than what is generally seen in alternatives. HPE ConvergedSystem 700 offers the opportunity to increase IT administrative efficiencies through the use of HPE OneView's templated approach to infrastructure provisioning and highly automated, policy-based features to manage servers, storage, and networks. As such, ESG estimates that activities such as system upgrades, system move/add/changes, and storage and networking administration may take anywhere from two to ten minutes less than with alternatives.
- Moreover, the automation of infrastructure provisioning enabled by HPE OneView helps to significantly reduce human error during application and service provisioning. This reduction in human error is carried through to resource changes and decommissioning with built-in logic to show dependencies on pending

changes, and prevents changes such as network or storage de-provisioning that would disrupt operations for system components. To account for this difference between HPE ConvergedSystem 700 and alternative integrated systems, ESG estimates that both planned and unplanned downtime may be reduced by as much as 15% due to the reduction of both the frequency of outages and their duration (planned or unplanned).

- Additionally, automated and more-stable application and infrastructure provisioning and management is modeled to positively impact not only the time and effort IT must devote to solving issues, but also the amount of time that application end-users must wait for their issues to be resolved.

TCO Analysis

For the hypothetical customer scenario described in Table 1, the estimated three-year total cost of ownership for HPE ConvergedSystem 700—compared with the three-year TCO estimated for the PMOs—is displayed in Table 4. As shown, from a TCO perspective, HPE ConvergedSystem 700 is expected to be significantly less expensive than either modeled PMO over a three-year time horizon. ESG estimates that compared with either PMO, HPE ConvergedSystem 700 customers should realize a considerable cost advantages in the areas of hardware and administrative staff.

Table 4. Three-year TCO, HPE ConvergedSystem 700 versus Alternative Virtualization Approaches

Category	HPE ConvergedSystem 700	Alternative integrated system PMO	Built-by-customer PMO
Hardware	\$392,404	\$575,250	\$468,813
Software	\$110,966	\$181,792	\$168,505
Infrastructure	\$11,500	\$20,396	\$24,475
Maintenance & Support	\$68,031	\$144,471	\$97,083
Professional Services	\$49,600	\$71,336	\$81,336
Staff Personnel	\$23,871	\$105,175	\$174,423
Total three-year costs	\$656,372	\$1,098,420	\$1,014,635

Source: Enterprise Strategy Group, 2014.

Major Cost Differences for ConvergedSystem 700 and the Built-by-customer PMO

- **Hardware:** ESG utilized publicly available component pricing from vendors and VARs when formulating how the model would configure the built-by-customer PMO. ESG’s analysis concludes that by purchasing a complete hardware stack, with integrated management software, as a single integrated system the customer is able to achieve lower costs compared with purchasing components like servers, storage arrays, switches, enclosures, and management tools separately. Much of this TCO reduction is due to the fact that HPE has dedicated its world-class engineering resources to balancing and optimizing resources in the ConvergedSystem 700 for virtualization workloads. IT organizations do not have capabilities commensurate with HP’s engineering skill and, as such, are estimated to overbuy system resources. To meet the requirements of the scenario described in Table 1, ESG estimates HPE ConvergedSystem 700 represents a 16% reduction in these costs over three years.
- **Administrative staff:** As a single pre-engineered system, ESG modeled planning, procurement, installation and integration processes associated with HPE ConvergedSystem 700 to be significantly reduced when compared with the built-by-customer PMO. In the scenario described in Table 1, ESG estimates HPE ConvergedSystem 700 represent a \$150,552 reduction in these labor cost areas.

Major Cost Differences for HPE ConvergedSystem 700 and Alternative Integrated System PMO

- **Hardware:** ESG utilized publicly available pricing from vendors and VARs, as well as its own research on competitive integrated platforms for the enterprise market segment, when formulating the costs the model would configure as the alternative integrated system PMO. ESG's analysis concludes that HP's ConvergedSystem 700 offers a more compelling price-performance ratio compared with many alternatives in the market. Additionally, the ability to scale ConvergedSystem 700 in single-server increments ensures hardware is not over purchased. To meet the requirements of the scenario described in Table 1, ESG estimates HPE ConvergedSystem 700 may represent over a 30% reduction in hardware costs over three years.
- **Administrative staff:** HPE ConvergedSystem 700 is a truly turnkey solution with all components manufactured and integrated by HP. Most other integrated platforms in the market today are the output of alliances among several different vendors. Many integrated platforms are in fact just reference architectures, which still require significant staff involvement to research, test, and stage prior to being production-ready. Moreover, while both scenarios offer improvements over a baseline of not virtualizing infrastructure, ESG has modeled the HPE ConvergedSystem 700 scenario to significantly reduce the ongoing systems management burden (as outlined in Benefits Analysis). As such, ESG estimates that the hypothetical customer described in Table 1 may experience an \$81,304 reduction in this labor cost over three years when selecting HPE over other integrated systems.

The Bigger Truth

As evidenced in ESG research, IT decision makers identify the total cost of ownership as the primary reason nearly one-fifth of current and potential integrated computing platform users invested—or plan to invest—in these solutions. The HPE ConvergedSystem 700 helps IT organizations maximize the value of virtualization, aligns with the demands of enterprise applications and IT's transition to cloud consumption models. The factory integration, scalability options, and management capabilities enable businesses to achieve efficient time to value coupled tightly to:

- **IT administration savings** – due to significant reductions in the time and resources required to plan, design, install, configure, and manage virtual and physical infrastructure and applications.
- **Ease of management** – thanks to integrated management tools and the automation of common IT tasks (due to HPE OneView).
- **Improved application performance and availability** – as a result of reliable, pre-integrated, tested, and qualified components, plus proactive monitoring across the complete infrastructure stack.
- **Accelerated time to value** – thanks to the faster, more agile deployment of applications and virtual infrastructure and improvements in IT operations.
- **Increased user productivity** – due to faster application deployments and reduced application downtime.
- **IT efficiency and agility** – by aggregating compute, storage, and network assets into homogenous resource pools that can be dynamically managed, automatically provisioned, and easily scaled according to need.
- **Streamlined service and support** – because customers can rely on a single organization, as opposed to many, for infrastructure support and consulting services.

The HPE ConvergedSystem 700 offers a consumption model that has the potential to revolutionize the way businesses think about data center infrastructure investments and plans for future cloud consumption models. The system simplifies deployment, automates routine IT tasks, reduces the time to value, meets the performance demands of business applications and provides consistency to a unified cloud consumption strategy during the complete hardware lifecycle. The HPE ConvergedSystem 700 forms a foundation for private cloud and the basis for hybrid cloud adoption. Management tools help bridge multiple consumption models through a common set of automation policies. Most businesses do not gain a competitive advantage or drive significant economic value based on their IT infrastructure components. They accelerate growth through improved business processes and well-planned application implementations, which in turn drive productivity and business results such as increased revenue. As evidenced by the profile of the financial benefits afforded by virtual infrastructure solutions in ESG's financial analysis, this is the real promise of new integrated computing platforms. Consequently, IT should look beyond today's IT operational challenges that have them hamstrung deep into the inner workings and configuration of the individual infrastructure components, and begin to embrace automation and intelligence designed into today's integrated computing platforms. Virtual computing solutions that are faster to deploy, easier to manage, that can automatically react to change, and predictably expand and contract based on business requirements are essential if IT is to implement a strategy that will have the most significant economic impact on the organization.

Appendix

Table 5. Cost Categories in the Scope of the Analysis

Category	Description
Hardware	<ul style="list-style-type: none"> For both HPE ConvergedSystem 700 and the built-by-customer PMO, this includes capital costs associated with enclosures, blade servers, network switches, and storage. Note that for the alternative integrated system PMO, ESG has assumed that hardware costs are inclusive of the total alternative system cost, which includes native management software.
Software	<ul style="list-style-type: none"> For HPE ConvergedSystem 700: <ul style="list-style-type: none"> Licenses for VMware vSphere. Licensing costs associated with HPE OneView system management software. For the built-by-customer PMO : <ul style="list-style-type: none"> Licenses for VMware vSphere. Licenses for comparable systems management and administrative tools. For alternative integrated system PMO: <ul style="list-style-type: none"> Includes licenses for VMware vSphere. For simplicity’s sake, costs for comparable systems management and administrative tools are captured within the hardware line item. Note application stack components, such as SQL Server, web servers, or other components, are not included in the scope of the analysis. ESG made general assumptions about application configurations that are the same for the systems/solutions compared.
Infrastructure	<ul style="list-style-type: none"> For all three scenarios, this includes costs related to data center infrastructure, such as racks, cables, power, cooling, and overhead.
Professional services	<ul style="list-style-type: none"> For all three scenarios, this includes additional services from IT suppliers or third-party firms to provide planning, design, implementation, best practice consulting, and training services. These include both one-time activities at the time of solution planning and installation as well as periodic additional activities (such as training) on an ongoing basis.
Staff	<ul style="list-style-type: none"> For all three scenarios, this includes IT staffing costs associated with tasks such as project management, system/solution procurement, and system deployment and management. Additional outcomes of reducing the time associated with these IT activities are captured as benefits. All position-specific salary information is based on publicly available median average salary data. For all employees, the model uses a fully burdened rate (i.e., cost of benefits, payroll taxes, etc.) of 40%.
Maintenance and support	<ul style="list-style-type: none"> For both the HPE ConvergedSystem 700 and the alternative integrated system PMO scenarios, support costs include both support for VMware software components and support for the system itself. Non-VMware support costs for HPE ConvergedSystem 700 are taken from current HPE pricing while those costs for the alternative integrated system are estimated to be comparable, on a percentage bases, with those for HP. For the built-by-customer PMO scenario, this applies primarily to software-related expenses, but also covers any necessary hardware- and infrastructure-related support costs. Support costs are estimated on an annual basis as 15% of the cumulative investments made.

Source: Enterprise Strategy Group, 2014.

Table 6. Benefit Categories in the Scope of the Analysis

Category	Description
IT efficiency savings	<ul style="list-style-type: none"> • For all three scenarios, this includes operational cost savings for IT staff related to the following activities: <ul style="list-style-type: none"> ○ Initial system design, integration, deployment, and configuration. ○ Systems maintenance, support, and management. ○ Resource management including storage and network management. ○ VM administration. • These savings are calculated based on the estimated number of IT staff hours required to perform those above tasks.
User productivity improvements	<ul style="list-style-type: none"> • For all three scenarios, this includes operational cost savings for application users related to the following activities: <ul style="list-style-type: none"> ○ Improved end-user productivity that results from faster virtual server and application installation and configuration ○ Improved end-user productivity that results from faster and less-disruptive virtual server and application upgrades and changes ○ Improved end-user productivity that results from reduced application downtime and performance impacts • These savings are calculated based on the estimated number of application end-user hours that are positively or negatively impacted by these events. For these calculations, ESG also assumes a productivity correction factor of 0.15 (i.e., the model assumes that 15% of the end-user hours “saved” will actually be productive hours).

Source: Enterprise Strategy Group, 2014.



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