

White Paper

Investigating and Confirming the Value of Intelligent Storage from HPE

Achieving Transformational Benefits with HPE's Intelligent Multi-cloud Storage Solutions

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October 2018

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Introduction

Data has more value today than ever before. In the case of newly emerging digital businesses, the data has *become* the business itself. But even for companies that generate their revenue in more traditional ways, their data can make them *better*. It helps them understand their customers better than before. They support their end-users better by running a more agile IT function. Even logistical operations such as manufacturing, shipping, and billing improve measurably. A company’s competitive success today depends greatly on how well it harnesses the value of its data.

However, it can be challenging to keep pace with the increases in the scale of data being generated as well as users’ demands for accessibility. And modern data accessibility requirements extend well beyond the data centre, from the edge to the cloud. Maximising the transformational value of digital information requires data to be leveraged at both the optimal time and the optimal place. This new requirement poses a challenge—since data has “weight,” it is costly and time consuming to move across locations.

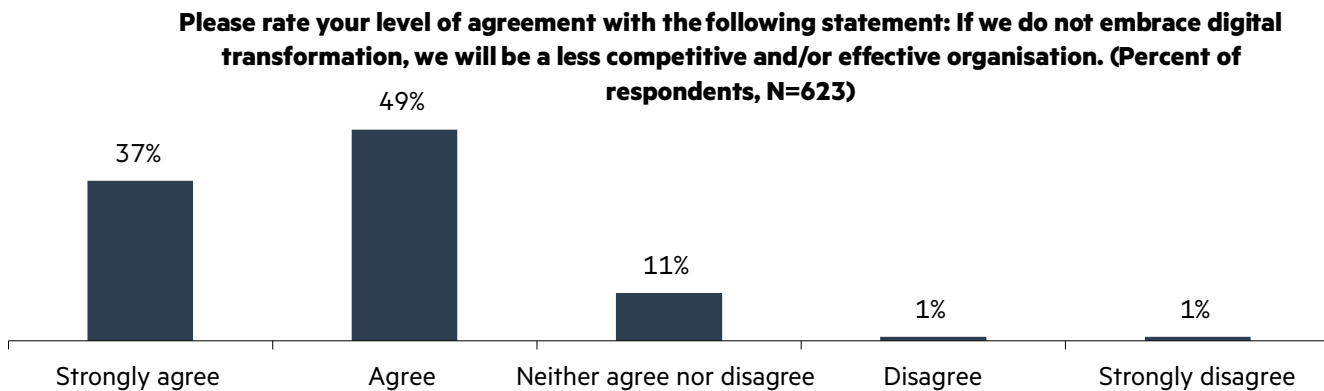
A modern data storage infrastructure that spans both on- and off-premises resources, with the intelligence to empower data, is absolutely necessary if a business wants to harness data’s value fully. Older, siloed storage environments limit efficiency and cost-effectiveness too greatly. They are just too expensive to procure, too expensive to manage, and too expensive to scale.

Sixty-eight percent of IT decision makers surveyed by ESG reported that their IT environments are either more complex or significantly more complex than they were just two years ago, with 41% of those decision makers citing higher data volumes as a cause.¹

The Digital Transformation Movement and Its Impact on Storage

Further complicating the issue is the fact that companies worldwide are now launching or growing large-scale digital transformation programmes. They have no choice. If they don’t do so, they will be less competitive and/or less effective—according to the combined 86% of respondents surveyed by ESG (see Figure 1).²

Figure 1. The Importance of Digital Transformation



Source: Enterprise Strategy Group

But digital transformation cannot succeed without a modern IT infrastructure in place. And architecting a modern IT infrastructure often starts with intelligent data storage technology. Traditional, siloed storage arrays were not designed to comprehend several realities of modern IT, including:

¹ Source: ESG Master Survey Results, [2018 IT Spending Intentions Survey](#), December 2017.

² *ibid.*

- **The massive surge in demand for data access:** Historical notions that only a small percentage of data needs to be accessible and performant at any given time have quickly been eroded. As data performance demands skyrocket, traditional storage systems are ill equipped to keep pace. And simply scaling traditional infrastructure is too costly, and ultimately unsustainable. Storage infrastructure must become more intelligent than traditional systems; able to understand workload specifics and then adapt accordingly to maximise the efficiency of available resources and serve the needs of modern, data-driven businesses.
- **The need for accessibility from the edge through the data centre to the cloud:** In similar fashion, the single data centre paradigm with a possible passive failover site has given way to the need for a single data ecosystem that spans the edge, the data centre, as well as multiple public clouds. Data must be resilient and available wherever and whenever necessary.
- **The direct relationship between inefficient IT and increased business risk:** Success in the modern economy requires transformed IT. Digital services drive the modern business, whether optimising production, improving customer engagement, or delivering new opportunities with digital products or services. Intelligent storage technologies that optimise IT infrastructure and operations, such as advanced data reduction and performance management, are competitive differentiators. When workloads are assured the right performance and when storage infrastructure is optimised, IT is efficient, enabling a better business.

While these realities can be, conceptually, addressed with traditional IT infrastructure, in practice the result is too costly, too unwieldy, and ultimately unsustainable. Achieving a transformed modern storage infrastructure requires technology with greater intelligence that can span multi-cloud ecosystems, in order to effectively empower businesses to compete in an ever-evolving digital economy.

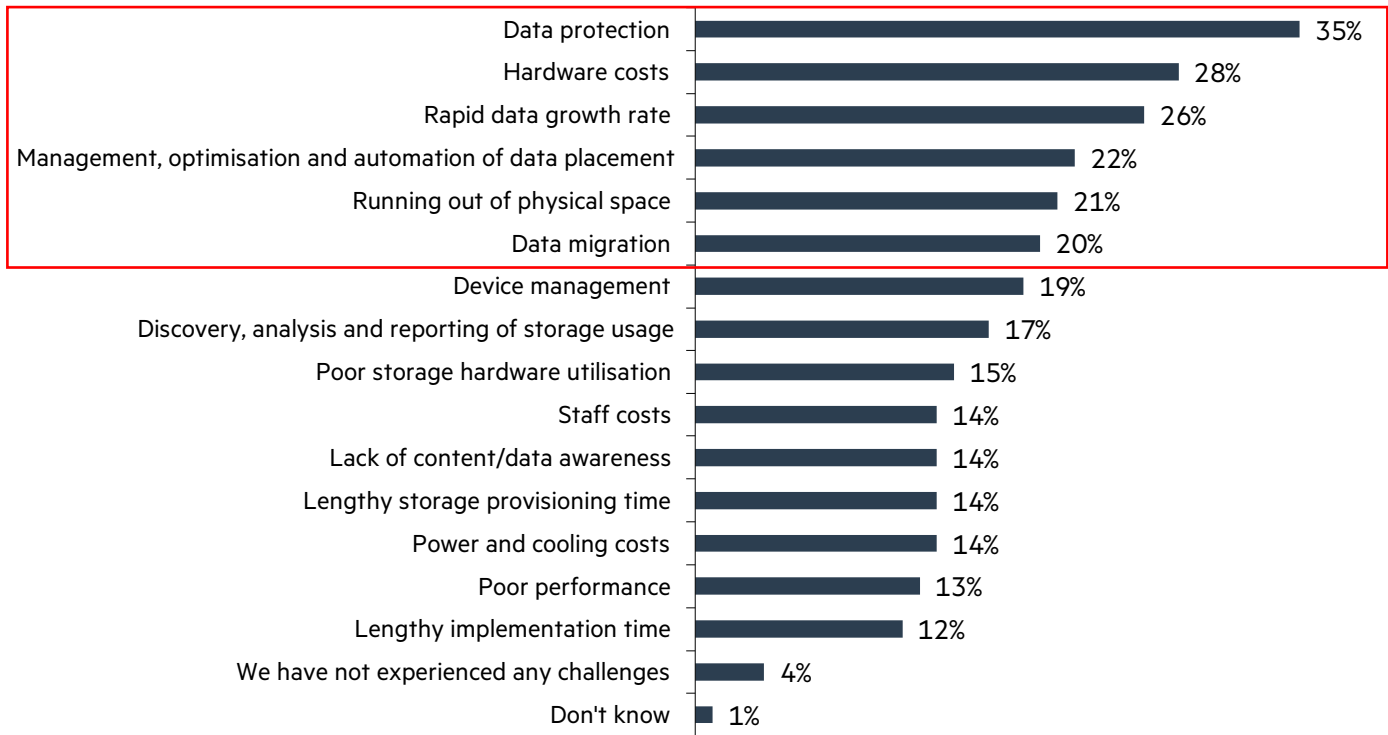
The Challenges of Modern Storage Infrastructure

As stated previously, the complexity of modern IT stems from the challenge of managing contemporary data demands and capacity levels. In a separate study on enterprise storage trends, the link between data and IT complexity is seen again. From the six most commonly identified storage challenges (see Figure 2)³, a similar narrative emerges: the rapid growth rate of data is driving up the costs of infrastructure and increasing the complexity of data protection. In addition, new technologies are making it more difficult to ensure data is placed on the right storage media in the right location, and the volume, or “weight,” of modern data levels makes it difficult to migrate data where it needs to reside.

³ Source: ESG Master Survey Results, [2017 General Storage Trends](#), November 2017.

Figure 2. Top Data Storage Challenges

In general, what would you say are your organization’s biggest challenges in terms of its storage environment? (Percent of respondents, N=356)



Source: Enterprise Strategy Group

Furthermore, the public cloud is a reality, and multi-cloud infrastructures have become the norm. According to ESG’s 2018 IT spending intentions study, 85% of IT decision makers indicated that they were currently leveraging public cloud service, with 81% of infrastructure-as-a-service (IaaS) and/or platform-as-a-service (PaaS) users currently leveraging more than one public cloud infrastructure provider.⁴ The introduction of off-premises public cloud options adds to the complexity of modern IT decisions.

It is important to reiterate that simply increasing spend to address modern storage complexities is ultimately unsustainable. Data storage infrastructure needs the necessary intelligence to carry this increased burden, and free the IT organisation and the business to focus on maximising the value of data, rather than focusing solely on trying to keep pace. HPE with its intelligent storage portfolio addresses the forces that reside at the core of the modern data challenge.

HPE Storage Objective: Deliver the World’s Most Intelligent Storage for the Hybrid Cloud World

IT has always been a complex endeavour. However, given how business results have become even more dependent upon IT capabilities, not only has the level of complexity increased, but addressing that complexity has also become more important. While multiple IT challenges were probably the catalyst behind HPE’s Intelligent Storage strategy, some of the most likely causes of the strategy include:

- **Rapidly evolving data requirements are difficult to predict:** A variety of storage solutions in the industry can scale to high capacities or deliver high performance. Addressing the modern data challenge requires the advanced artificial intelligence-based capability to predict changes and quickly adapt to evolving and growing application demands. Waiting for an issue to manifest and then deciding to act with a traditional infrastructure design and procurement model is too slow for today’s IT.

⁴ Source: ESG Master Survey Results, [2018 IT Spending Intentions Survey](#), December 2017.

- **Public cloud services are valuable resources, but they change the data centre paradigm:** The economics that fuel the cost of public cloud services are often very different from those of on-premises infrastructure. Data access and movement can incur high costs in the cloud, which may go unseen until after a migration is made. Infrastructure needs to be built for cloud, so adjustments are quicker and painless.
- **IT needs a data-level focus, not an equipment-level focus:** At modern data capacity levels, aligning hardware infrastructure to specific workload needs is a complex endeavour, made even more complex as hardware ages and new technologies emerge. Workloads and their data need infrastructure capabilities delivered as-a-Service with the flexibility to adjust and stay optimised as needs evolve.

In recent years, HPE has delivered multiple data centre-level innovations designed to augment HPE Storage technology by dramatically simplifying data movement from the edge to the cloud, maintaining data centre design and support, while optimising the cost of keeping the infrastructure current with new technology adoption. These solutions complement HPE's innovative set of storage technologies, including Nimble, 3PAR, and SimpliVity. The cumulative result is that HPE is offering its broadest storage portfolio to date.

AI-Driven Infrastructure with HPE

Data can be unpredictable. Specifically, IT admins find it hard to predict their organisation's future storage needs accurately. When they guess wrong, they end up increasing costs and complexity. Twenty-two percent of IT managers surveyed by ESG reported experiencing problems managing, optimising, and automating data placement. Another 17% described challenges with discovery, analysis, and storage-usage reporting.⁵ They need a storage infrastructure that understands an application environment today and tomorrow, one with the intelligence to anticipate and even prevent issues from occurring across the infrastructure stack

HPE InfoSight Artificial Intelligence Delivers a New Level of Understanding

HPE InfoSight is an advancement in machine learning, as thousands of sensors are embedded within the storage operating system to resolve slowdowns and other problems before anyone knows they are happening.

HPE InfoSight leverages artificial intelligence to monitor data storage infrastructure at a level simply unrealistic for human administrators. As a result, HPE InfoSight delivers a greater understanding of workload evolution and infrastructure performance, predicting issues before they occur and isolating concerns as they arise. With these capabilities, HPE InfoSight can solve the problems storage often is unfairly blamed for, such as VM

contention issues, network problems, configuration errors, and overloads affecting specific areas. Critical IT personnel resources are freed to address larger, higher-level tasks. When human intervention is required, HPE InfoSight directs the administrator to the problem component, rather than requiring a lengthy and costly issue isolation process.

ESG validated that HPE's InfoSight lowered IT operational expenses by 79%.

HPE states that HPE Storage with HPE InfoSight:

- Delivers greater than 99.9999% availability (basing that claim on the performance of the install base).

⁵ Source: ESG Master Survey Results, [2017 General Storage Trends](#), November 2017.

- Automatically predicts and resolves 86% of issues automatically.
- Is even able to predict and resolve problems outside of storage. Per HPE, 54% of the problems that HPE InfoSight finds and resolves are outside of storage.

ESG validated HPE InfoSight's predictive capabilities in a custom research project commissioned by HPE and published by ESG in September 2017.⁶ ESG found that users of HPE Nimble Storage enjoy significant benefits. At those organisations, HPE Nimble Storage with HPE InfoSight resulted in, on average:

- 79% lower IT operational expenses.
- 73% fewer trouble tickets in the environment.
- 85% less time spent resolving storage-related trouble tickets.
- 69% faster time to resolution for events necessitating level 3 support.
- The ability to manage and troubleshoot an entire environment from a single, intelligent platform.

While these studies were conducted on HPE InfoSight and HPE Nimble Storage, HPE offers InfoSight across its HPE 3PAR Storage systems as well. Together, HPE InfoSight and HPE Nimble Storage and HPE 3PAR deliver transformational value to IT organisations and their users.

With IT success essential to modern business success, the advanced intelligence of HPE InfoSight delivers an incredible advantage. As workload demands increase, assuring that each workload has access to the necessary level of performance becomes more complex. Application performance management in traditional IT environments drains personnel resources. HPE InfoSight's predictive capabilities address performance management challenges along with a multitude of other storage infrastructure support and management complexities. The wealth of resources freed up thanks to the intelligence of HPE InfoSight can be applied a variety of ways, further improving efficiency, developing new business opportunities, or simply freeing up budget and personnel. The result helps eliminate business risk, by dramatically reducing the cost and complexity of IT.

HPE OneView and HPE Pointnext

Complementing HPE InfoSight's ability to radically simplify IT infrastructure management and maintenance are HPE OneView and HPE Pointnext. HPE OneView offers a software-defined intelligence layer designed for automating data centre infrastructure lifecycle operations, such as provisioning storage, compute, and fabric resources. HPE OneView presents a single view and a REST API set for managing, monitoring, and provisioning heterogeneous on-premises infrastructure environments. IT organisations can expand automation activities that accelerate tactical operations while freeing up cycles for IT administrators.

With HPE Pointnext, HPE rounds out its extensive IT automation and analytics innovations with a data profiling service. The industry-wide surge in unstructured (or file) data growth over recent years shows no signs of slowing down. For example, digital media workloads—a workload quite dependent on file-based data—is the most commonly identified driver of the growth.⁷ While massive capacity growth is nothing new, the rise of analytics workloads and even artificial intelligence (AI)-based initiatives are placing a newfound importance on file data. With HPE Pointnext, HPE offers either an option of a one-time service engagement or a recurring engagement where HPE experts analyse the user's file data environment and provide insights, such as areas of wasted space, identified duplicates, as well as last modified and last accessed files, file growth reporting, and details of storage usage by file type.

⁶ Source: ESG Research Insights Paper, [Assessing the Financial Impact of HPE InfoSight Predictive Analytics](#), September 2017.

⁷ Source: ESG Master Survey Results, [2017 General Storage Trends](#), November 2017.



Why This Matters – AI-Driven Infrastructure with HPE

- HPE InfoSight's AI-based monitoring transforms IT; ESG validated IT operational expenses were reduced by 79%.
- With HPE OneView, IT administration can deliver self-service automation across heterogeneous data centres accelerating IT delivery, while reducing the resource burden.
- With HPE Pointnext, HPE delivers expert insights into file data specifics, optimising file environments and better enabling businesses to maximise the value of their file data.

HPE: Built for Cloud

Public cloud services are playing a growing role across the IT industry. In 2017, the use of cloud storage as a way to source capacity without buying new on-premises infrastructure was the IT initiative that survey respondents most frequently identified as having an impact on their storage spending.⁸

With multi-cloud infrastructure now the norm, storage decision makers often consider the cloud as a key component to their data-growth challenges, requiring data to be accessible regardless of location. The cloud provides access to a seemingly endless pool of off-premises capacity. It is an architecture that offers flexible scalability with data mobility between systems and locations.

Managing a multi-cloud infrastructure at scale, however, can quickly become cumbersome. Data is “heavy,” so it takes time and money to move. Without the necessary level of storage intelligence, cloud resources are hindered, resulting in reduced operational effectiveness and higher costs.

HPE's built-for-cloud technology vision is to no longer restrain the value of public cloud resources by addressing the data movement issue directly. HPE endeavours to enable its customers to move and run any workload on the cloud, edge, or core from production through big data to backup and leverage multiple clouds effectively in concert with on-premises resources. While this vision is part of HPE product design, the fruits of HPE technology are probably most visible as part of HPE Cloud Volumes, HPE Cloud Bank Storage, and HPE OneSphere offerings.

⁸ *ibid.*

HPE Cloud Volumes

HPE Cloud Volumes is a public cloud-based storage service built on HPE Nimble Storage technology and designed for Amazon Web Services (AWS) and Microsoft Azure. HPE has deployed cloud storage infrastructure in data centres in close proximity to AWS and Azure's hyper-scale data centres. This proximity allows for IT organisations to still leverage AWS or Azure for compute, while accessing HPE Cloud Volume Storage. Unlike the more common public cloud storage services, HPE Cloud Volumes are designed for enterprise-level business applications, typically SAN workloads, such as Oracle, SQL, or SAP. With native Amazon Web Services and Azure integration, HPE removes the need for third-party gateways and tools.

Some specific differentiators for HPE Cloud Volumes include:

- **No data egress charges:** Since it is an HPE service and not built on top of another cloud storage service, there are no data egress charges when moving data between HPE Cloud Volumes and the data centre. In addition to the cost savings, removing data egress charges dramatically simplifies IT architecture decisions. If data egress increases over time, the cloud can still be a viable infrastructure option.
- **Enterprise-scale volumes:** Public cloud infrastructure services can often limit volumes to smaller capacity sizes, such as 4TB. This hinders the scalability of enterprise-level applications. HPE offers the ability to scale to higher capacities, increasing its applicability for enterprise consumption.
- **Enterprise-level functionality:** HPE Cloud Volumes offers 256-bit AES encryption, instant snapshots for faster backups and recovery, instant zero-copy clones for Dev/Test, analytics, and cloud bursting. Users pay only for the changed data, and not the full copy. Combined, these enterprise features simplify application deployment while further reducing costs.
- **Secure and efficient data movement:** Move data securely and efficiently with encryption, change block tracking, deduplication, and compression.
- **Cost predictability with HPE InfoSight:** Integration with HPE management eliminates the requirement to evaluate and procure third-party tools to monitor and manage cloud infrastructure. With HPE InfoSight, HPE Cloud Volumes is able to estimate charges and display continually updated cost and usage information. This level of detail offers cost predictability, helping to eliminate budgetary surprises. Additionally, HPE InfoSight allows data visibility and management across clouds as well as the data centre(s) to predict and prevent problems.

The screenshot shows the 'CREATE CLOUD VOLUME' interface. It has a green header with a close button. Below the header is a progress bar with four steps: 'Cloud Provider', 'Volume Settings', 'Protection', and 'Review'. The 'Volume Settings' step is currently selected. The main content area contains several input fields: 'Volume Name' with the value 'SQL ERP prod' and a price tag of '\$545.76/month'; 'Size (GiB)' with a value of '2048' and '+' and '-' buttons; 'IOPS' with a value of '5000' and '+' and '-' buttons; 'Cloud Application' with a dropdown menu showing 'SQL'; and 'Volume Type' with a dropdown menu showing 'Premium Flash'. At the bottom, there are two green buttons: 'PREVIOUS' and 'NEXT'.

Figure 3: Interface to Create an HPE Cloud Volume

HPE Cloud Bank Storage

As the volume of data stored increases, the complexity of protecting data increases as well, often more severely. As presented in Figure 2, data protection is the most commonly identified storage-related challenge. Despite IT's increasing role as a business enabler, ensuring IT service and data availability and data protection is still job number one.

HPE Cloud Bank Storage offering is built upon HPE StoreOnce technology, which enables it to leverage cloud-level backup either on- or off-premises with support for Amazon Web Services, Microsoft Azure, or private clouds with Scalify RING technology. With HPE StoreOnce, de-duplication technology, HPE minimises bandwidth required for data transfers to and from data storage within the cloud. HPE Cloud Bank Storage can also archive data sets for long-term retention to highly scalable, cost-effective object storage.

HPE Cloud Bank Storage integrates with existing HPE environments, as current HPE StoreOnce users only need to add an HPE Cloud Bank Storage license. With HPE Recovery Manager Central (RMC), the combined validated solution can deliver enterprise-level granularity for both recovery point objectives (RPOs) and recovery time objectives (RTOs). These tools deliver a flexible and cost-effective solution for achieving offsite data protection on public cloud-based infrastructure resources.

Leveraging a validated solution that can deliver on expected RPOs and RTOs is paramount for modern IT. Businesses rely on data. When IT services are interrupted, data recovery is the top priority. HPE offers fast and reliable recovery, instilling confidence for IT organisations while reducing risk to the business.

HPE OneSphere

With HPE OneSphere, HPE offers an as-a-Service hybrid cloud management solution. Modern digital business services often require a partnership of developers, line of business teams (LoBs), and IT working in concert. While that might be the ideal, the limitations of infrastructure management and control often introduce unnecessary divisions and complexities that impede efforts. As a result, teams can often charge ahead without the consent of their partner teams, expending effort, but ultimately introducing complexity that must be addressed down the line. HPE OneSphere offers a single management platform for hybrid cloud infrastructure, designed to service the needs of developers, LoBs, and IT teams that can support both cloud-native and containerised applications as well as the more traditional workloads.

This level of hybrid/multi-cloud infrastructure simplification is a must for businesses. In ESG's research of multi-cloud IT environments, 53% of multiple cloud users identified that they prefer a single solution to manage the entire multi-cloud environment.⁹ With HPE OneSphere, IT organisations can pool infrastructure resources across on-premises data centre and public cloud services with consolidated management and reporting on usage costs. HPE OneSphere allows multi-cloud infrastructure to be self-provisioned by the applications through REST APIs, spurring DevOps initiatives and the development of self-service catalogues to automate IT services provisioning and deployment.



Why This Matters – HPE's Built for Cloud Commitment

- With HPE Cloud Volumes, HPE is delivering enterprise storage as a cloud service, removing the data egress charges, and eliminating a common and significant cloud pain point while simplifying IT architectural decisions.
- With HPE Cloud Bank Storage, HPE simplifies the process of leveraging the public cloud for offsite data protection, addressing the most common enterprise storage challenge.
- HPE OneSphere delivers a single hybrid cloud management platform with consolidated cost reporting that helps eliminate the risk associated with hybrid cloud decisions.

As-a-Service Experience with HPE

For too long the focus of IT has been on “infrastructure technology” rather than “information technology.” IT organisations have long dedicated precious resources to managing the nuances of infrastructure equipment rather than focusing on maximising the value of digital information. The opportunity to access storage infrastructure and capabilities as needed, or as-a-Service, can enable the business to focus on what matters, the data, while simultaneously improving cost efficiency. For example, a storage infrastructure needs to accommodate hardware refreshes without threatening data accessibility or limiting financial flexibility. IT organisations should only have to pay for what they use, while not being impacted by refresh cycles.

⁹ Source: ESG Master Survey Results, [The Emergence of Multi-cloud Strategies](#), April, 2018.

A siloed storage architecture is complex. Each time hardware changes, new and complex tasks consume precious administrative time—i.e., data migrations consume resources, and both storage provisioning times and implementation times lengthen. With each new addition, massive capital expense outlays are required. Those challenges directly relate to the inherent complexity and cost of siloed storage architectures.

According to ESG's 2018 IT spending intentions study, IT architecture and planning is the second most commonly identified IT skill shortage, behind only cybersecurity, with one third (33%) of IT decision makers identifying the skills gap.¹⁰ Eliminating the complexity of consistently re-architecting the IT ecosystem is a worthwhile effort.

When delivered as-a-Service, storage infrastructure offers the architectural and financial flexibility to let the organisation “go anywhere” thanks to future-proofed platforms and guaranteed availability. While it's a design tenet for HPE's hardware and it's built for the cloud solutions, HPE is also delivering storage infrastructure as-a-Service through HPE GreenLake Flex Capacity and HPE GreenLake Hybrid Cloud programmes, the role of HPE Financial Services, and the HPE Get 6-Nines Guarantee, transforming how IT organisations maintain an infrastructure ecosystem built on the latest technologies.

HPE GreenLake Flex Capacity

With HPE GreenLake Flex Capacity, HPE provides its customers a pay-per-consumption storage-as-a-Service, with the ability to scale either up or down. As part of the programme, HPE works with IT organisations to forecast their specific capacity demands and projections to establish a minimum commitment. HPE then establishes a local buffer of IT resources so extra capacity is ready to be activated when needed, accelerating infrastructure provisioning. In addition to extra on-premises resources, HPE partners with Microsoft Azure public cloud to expand into cloud resources, if and when necessary.

HPE GreenLake Flex Capacity also includes a customer portal that displays capacity usage data, so IT decision makers can assess performance and costs in real time and adjust quickly. HPE also includes enterprise-grade support for a pro-active support experience designed to work together with the user's IT team. HPE claims a personalised support experience tailored to the user's infrastructure and their choice of on-premises servers, storage, and networking.

Further simplifying the engagement, HPE offers its HPE GreenLake Flex Capacity service as a single contract and one monthly invoice based on consumption and usage. HPE also does not require an upfront payment. These financial elements address a significant, but often overlooked, pain of managing IT scale: managing all the licenses that accompany all the hardware, software, and services.

Shifting from an upfront capital-intensive infrastructure payment model to a pay-as-you-go programme, will likely improve spending efficiency and reduce the total cost of IT ownership. HPE GreenLake Flex Capacity is poised to do more than just that, however. By streamlining the IT resources acquisition process, new technologies are available faster and easier, speeding up the delivery of IT services while simultaneously reducing the cost of IT.

Additionally, HPE GreenLake Flex Capacity reduces the risk of IT ownership with HPE Financial Services in helping IT organisations select the right funding model.

¹⁰ Source: ESG Master Survey Results, [2018 IT Spending Intentions Survey](#), December 2017.

HPE GreenLake Hybrid Cloud

Extending HPE's cloud-based innovations as well as its as-a-Service experience is HPE GreenLake Hybrid Cloud, which delivers consumption-based, turnkey automation for hybrid and public cloud environments. As part of the service, HPE optimises and automates on- and off-premises infrastructure for a single hybrid cloud pay-per-use service. Charges are based on only resources in use, optimising both infrastructure and management costs. HPE works with users to define processes to manage hybrid cloud resources and then establish cost, security, and compliance controls. With the controls in place, HPE manages the resources. Ultimately, HPE assumes the day-to-day routine maintenance, allowing its users to focus on their businesses.



Why This Matters – Infrastructure delivered as-a-Service with HPE

- IT architecture and planning are skill shortages for 33% of IT organisations. As IT complexity increases, HPE delivers not only advanced technology, but also services like HPE GreenLake Flex Capacity and HPE GreenLake Hybrid Cloud that streamline and automate architectural decisions on how best to leverage that technology, reducing the cost of IT and accelerating service delivery.
- Workload demands are ever-changing and evolving, typically not aligning to a stable growth curve. HPE offers a flexible pay-as-you-go plan, with the tools to predict workload changes and adapt in real time.

HPE's Extensive Intelligent Enterprise Storage Portfolio

HPE complements its AI-driven, built for cloud, and experienced as-a-Service IT software and services innovations with a robust portfolio of enterprise storage systems. [HPE](#)—with its 3PAR, Nimble Storage, SimpliVity, and MSA storage lines—is currently providing its channel partners and end-user customers with access to the broadest and richest storage portfolio this vendor has ever offered.

HPE Nimble Storage

HPE Nimble Storage is hardware configurable either as an all-flash or hybrid-flash system. ESG's research into all-flash technology revealed that the major benefits of solid-state centre on improved application performance (mentioned by 55% of respondents), reduced power consumption (34%), improved resource utilisation (33%), and improved TCO (27%).¹¹

With HPE Nimble Storage's scale-out architecture, an IT organisation can mix together multiple physical systems, models, and generations. In addition, HPE Nimble Storage can scale in multiple dimensions by attaching additional storage shelves or non-disruptively scaling the performance with upgrades. In other words, an organisation can grow from the lowest-end system to the highest-end without impacting its applications.

HPE Nimble Storage's flash fabric spans primary flash, secondary flash, and multi-cloud storage, as HPE Cloud Volumes enables data to flow between onsite arrays and the cloud. HPE Nimble Storage is consumable via HPE's monthly pay-as-you-go service accessible through a web portal, and end-users can specify the capacity, performance, and optional features they need. Those volumes connect to the AWS or Azure cloud, and they're ready for use immediately. Older or less-expensive hybrid Nimble arrays can even be optimised for secondary storage in the cloud (i.e., for backup, test/dev, QA, analytics, or DR).

The Value of HPE's Portfolio

"The current portfolio is the best that I've ever seen or been a part of in my 30-year association with [HPE]." – chief sales officer at an IT solution provider

¹¹ Source: ESG Master Survey Results, [2017 General Storage Trends](#), November 2017.

HPE 3PAR Storage

HPE 3PAR Storage is an extremely high-performing all-flash array, equally suited for both medium-sized firms and large enterprises with petabyte-scale storage needs. HPE 3PAR Storage is also a powerful option for cloud service providers, as it can accommodate instant application provisioning and provide high levels of service to support subscribers' mission-critical workloads.

HPE 3PAR Storage offers a high-performance storage (multi-tenet parallel I/O processing) architecture that is both scale-out and flash-optimised. Designed for mission-critical workloads, HPE 3PAR is part of the HPE Get 6-Nines Guarantee for data availability. This is in addition to delivering all the other critical enterprise storage capabilities such as quality of service (QoS) to ensure application performance, adaptive data reduction, and a flexible remote replication capability that supports multiple HPE 3PAR Storage models with, according to HPE, the ability to achieve near-synchronous RPOs.

HPE 3PAR Storage also supports HPE Cloud Volumes and offers cloud-like, flexible consumption options including pre-provisioning and pay-as-you-go options. To deliver an "always-on," or timeless, enterprise storage capability, HPE 3PAR Storage offers non-disruptive migration and technology refreshes. Applications remain unaffected as the hardware evolves to meet IT demands.

HPE SimpliVity

HPE SimpliVity represents HPE's hyperconverged infrastructure (HCI) technology portion of the portfolio: an all-in-one virtualisation solution combining compute and software-defined storage in a single box. Organisations find HCI solutions appealing because they make operating a virtual IT environment dramatically simpler. For example, organisations considering HCI are citing adoption drivers such as improved scalability (31%), improved TCO (28%), ease of deployment (26%), and simplified systems management (24%).¹²

While modern storage infrastructure solutions can also deliver many of those benefits, HCI solutions, such as HPE SimpliVity, consolidate storage provisioning and VM management activities. The result of this management consolidation automates the storage infrastructure to the point that the vAdmins can take over the storage provisioning and management responsibilities. That efficiency improvement, in turn, frees up the infrastructure team to focus on higher-value-add, strategic tasks.

The pre-integrated HPE SimpliVity solution uses a building block approach to simplify the deployment and management of a highly virtualised environment. VM-centric management enables improved operational efficiency, and all-flash storage delivers high levels of sustainable performance. It includes storage features that will boost efficiency without negatively affecting performance, such as compression and de-duplication, plus built-in resiliency that ensures workloads can survive infrastructure failures. With these features, organisations gain a complete IT infrastructure built with proven technology that delivers the simplicity and speed they demand.¹³

ESG Validates SimpliVity

A two-node HPE SimpliVity 380 cluster easily handled the production-like workload of up to nine business applications. Even with a diverse set of workloads of varying I/O sizes, seek types, and read/write ratios, response times were impressively low, with an average response time across all applications of 3.9ms.

¹² Source: ESG Master Survey Results, [Converged and Hyperconverged Infrastructure Trends](#), October 2017.

¹³ Source: ESG Lab Validation, [The All-flash HPE SimpliVity 380: Simplicity, Performance, and Resiliency](#), July 2017.

ESG Lab was able to confirm HPE's ability to check off IT organisations' most-often-cited "must haves" when it comes to a hyperconverged solution: scalable systems management, built-in data protection, and the ability to scale up and out.¹⁴ They are provided on HPE's proven hardware, as multiple applications run simultaneously on a single cluster while continuing to meet business-critical performance SLAs for all applications.

A mixed-workload, real-world performance evaluation by ESG Lab validated SimpliVity's high IOPS and low latencies. A two-node HPE SimpliVity 380 cluster easily handled the production-like workload of up to nine business applications. Even with a diverse set of workloads of varying I/O sizes, seek types, and read/write ratios, response times were impressively low, with an average response time across all applications of 3.9ms.¹⁵



Why This Matters – HPE Storage Technology

- HPE Nimble Storage's ability to scale its flash-fabric technology in multiple dimensions, non-disruptively, offers incredible deployment flexibility complementing HPE's pay-as-you-go models.
- When coupled with HPE Get 6-Nines Guarantee for data availability, HPE InfoSight, and HPE Cloud Volumes, HPE 3PAR Storage evolves from a performant storage system for mission-critical workloads to a highly capable and highly resilient data storage hub for an enterprise, mission-critical hybrid cloud infrastructure.
- By augmenting the simplicity delivered by HCI, HPE SimpliVity's ESG Lab validated high IOPS, and low latency performance make the technology an attractive option for enterprise production workloads.

Complementing the HPE Storage Portfolio

Built leveraging Intel technology, HPE Nimble Storage, HPE 3PAR Storage, HPE SimpliVity, and HPE MSA provide the bulk of the HPE Storage portfolio, while the remaining breadth of HPE's IT products, services, and solutions complete the story. Given the complexity of modern IT demands, working with a single vendor that can provide an end-to-end infrastructure portfolio with servers, storage, and networking offers both simplicity and peace of mind. HPE customers can take comfort that the individual technologies are designed and validated to work together. For example, HPE has created multiple integration points with HPE 3PAR, such as HPE Smart SAN for 3PAR, which significantly simplifies SAN zoning, expediting deployments and reducing the risk of human errors.

Along with the integration benefits, HPE offers a variety of complementary technologies designed to complete the larger data centre solution. With HPE StoreOnce, HPE offers a disk-based backup solution. With HPE Synergy, IT administrators are provided a single composable infrastructure platform to manage HPE compute, storage, and networking with a single API to help automate the infrastructure. With software-defined and template-driven workload composition, HPE Synergy can provision workload-ready hosts in minutes across pools of disaggregated infrastructure resources.

In addition to the four product lines covered in this paper, HPE extends its storage portfolio across other innovations. For example, with HPE StoreEasy and HPE 3PAR File Persona, HPE augments its SAN storage offerings with optimised, efficient, and secure file storage options. With the HPE XP7 platform, HPE provides a 99.99999% storage infrastructure platform designed for applications requiring 100% data availability. HPE also offers products from emerging storage innovators across the industry, such as Qumulo for scale-out file storage and Scalify for object storage, to ensure that its partners and customers have access to the broadest set of enterprise storage solutions.

¹⁴ Source: ESG Master Survey Results, [Converged and Hyperconverged Infrastructure Trends](#), October 2017.

¹⁵ Source: ESG Lab Validation, [The All-flash HPE SimpliVity 380: Simplicity, Performance, and Resiliency](#), July 2017.

Furthermore, the single end-to-end IT vendor model provides a single contact for services and support, which reduces the risk of IT being stuck in the middle of multiple vendors when diagnosing an issue. The result reduces both the risk and cost of maintaining and servicing data centre infrastructure. This is in addition to HPE's established reputation for both quality and innovation. And now with HPE's 100% channel-partner focus, HPE is dedicated to best enabling each partner to meet the needs of her IT organisation clients as capably and effectively as possible.

The Bigger Truth

Data has value. A business' ability to compete in this modern digital economy is defined by how well it leverages its data. As a result, the IT organisation moves to the frontline as companies battle for market supremacy. Given the importance of data and IT in this new digital economy, it just makes sense that IT organisations need to be equipped with the best tools (or in other words, a modern and intelligent IT infrastructure) to deliver the maximum benefit to the company. HPE understands this reality, and it has now put together its richest and broadest storage technology portfolio to date.

If you are a channel partner looking for a solid technology innovator, or if you are working in an IT organization that wants to modernise the *right* way, remember that HPE is a leader in this space and a company certainly worthy of consideration as a partner.

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