Getting Ahead of the Infrastructure Change Curve in the Data Centre

Contents

Abstract

Constant change in infrastructure is not a new phenomenon, but the pace and intensity of change cycles is reaching new extremes. Rapidly shifting business needs warp the infrastructure-change curve. These needs put pressure on IT to build and modify infrastructure in timeframes that would have been hard to imagine not long ago. Infrastructure managers need to stand up compute capacity, storage, databases, and connectivity essentially on demand and then scale and reconfigure in near real time. This paper looks at how enterprise IT managers have tackled these serious infrastructure challenges using the HPE BladeSystem and HPE OneView management software tools.

Introduction

IT managers are accustomed to change. After all, corporate information technology has been the harbinger of future states of business since the 1950s. New ways of doing business, coupled with the steady evolution of technology, have resulted in continual changes in the way IT departments deploy and manage infrastructure. Figure 1 shows this interdependency.
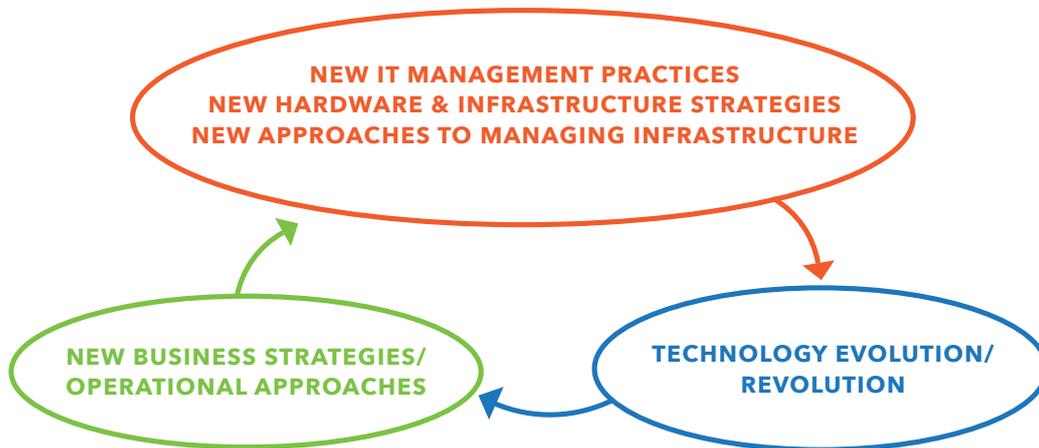

Figure 1 - The constant drive for change in infrastructure management and hardware.

Today, though, the pace and intensity of change in IT has picked up considerably. IT has to stay ahead of an accelerating infrastructure-change curve in the datacentre. That curve, which reflects IT's ability to change infrastructure in keeping with business needs, is under pressure. The time between "Nice to have," "Have to have," "Why isn't it better?" and "Fix it or you're fired" has grown disturbingly short.

Using best practices and product reviews from practising IT managers, this paper describes how organisations can tackle these new, serious infrastructure challenges using the HPE BladeSystem together with HPE OneView management software. It discusses the potential to move toward a composable infrastructure, an approach to the datacentre where IT resources exist in fluid pools that can be allocated and modified on demand with software-defined intelligence. Composable infrastructure enables dynamic management as critical business needs change.

Overview: The Accelerating Infrastructure Change Curve

Rapid moves by business management, usually in response to equally fast-moving customer expectations, now put pressure on IT to modify infrastructure at the same pace. Change factors include mergers and acquisitions (M&A), strategic shifts, and organisational restructuring.

Effects on IT Management

New approaches to managing IT have arisen in response to shifts in how business is conducted. Bimodal IT, for instance, divides IT management into two spheres: one for traditional, sequential, steady-state IT that supports core operations, and another for faster-moving, more agile IT projects. Figure 3 captures the balancing act that IT managers must perform to keep both sides of the business happy.

Application development has also evolved to support new ways of doing business. DevOps, which blends application development processes and teams with IT operations, enables fast-paced development. Integrated operations makes software deployment and change cycles occur far more quickly than is possible with the sequential, "waterfall" approach used traditionally.

Continuous integration (CI) takes the process even further, using specialised software tools that let developers
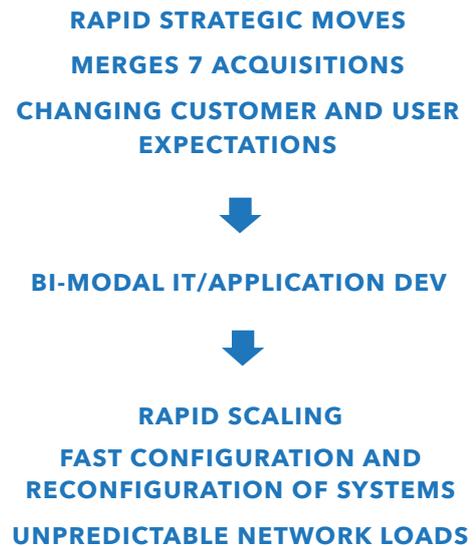
RAPID STRATEGIC MOVES

MERGES 7 ACQUISITIONS

CHANGING CUSTOMER AND USER EXPECTATIONS

⬇

BI-MODAL IT/APPLICATION DEV

⬇

RAPID SCALING

FAST CONFIGURATION AND RECONFIGURATION OF SYSTEMS

UNPREDICTABLE NETWORK LOADS

Figure 2 – The new, fast pace of business change and its effects on IT create a host of new realities for infrastructure management.

HOW CAN I SUPPORT BOTH?

TRADITIONAL BUSINESS

TRADITIONAL APPS
OPS DRIVEN
COST-FOCUSED

THE IDEA ECONOMY

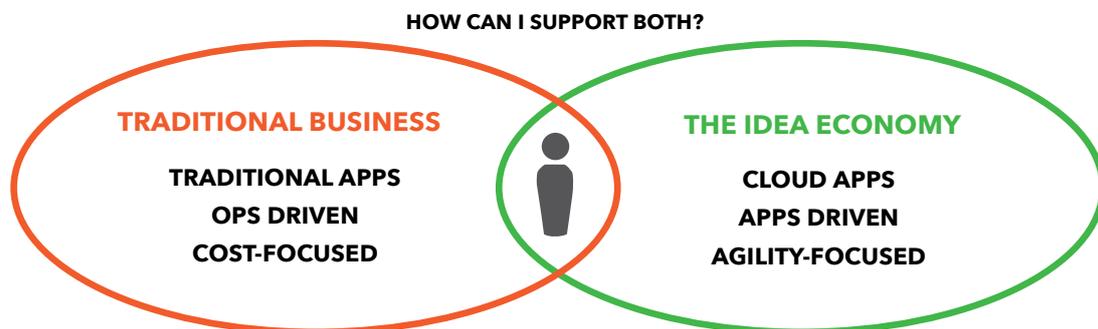**CLOUD APPS**
APPS DRIVEN
AGILITY-FOCUSED

Figure 3 – The need for bimodal IT, an approach that balances demands to manage traditional apps on an ops-driven, cost focused basis versus the mandate to build new applications for the idea economy on a rapid, agile basis.

integrate new code into production instantly. Such advances are driven by increasingly sophisticated customer expectations. Today's consumers, for example, may want their favourite brands to offer rich mobile interaction as a condition of doing business.

New Realities for Infrastructure

The need for competitive differentiation requires a different way of thinking about technology design and use. While space, resources, personnel, skillsets, and capacity typically remain constrained, IT managers must confront a new reality defined by:

- **Rapid deployment** - Infrastructure managers need to stand up compute capacity, storage, databases, and connectivity essentially on demand. With DevOps, for instance, the time between the start of software development and "go live" in production might be days, not months. Infrastructure has to be ready in time.

- **Scaling in step with demand** - Usage levels for new applications can rise quickly in the digital enterprise.

In response, managers need to be able to scale infrastructure in near real time.

- **Quick reconfiguration of systems** - Configurations need to change in-time with software development lifecycles that seem almost manic in comparison to agile methodologies.

- **Unpredictable network loads** - Network loads can spike in reaction to digital engagement with customers, as exemplified by virality. This is still a relatively novel concept for IT managers.

- **Unpredictable storage and database requirements** - Storage and data management changes with the advent of previously unknown practices like video meetings. The setup of databases may also need to shift rapidly as new applications deploy and scale.

- **Maintenance of service levels despite constant system changes** - As IT grows more central to maintaining customer relationships, service levels have to be reliable no matter how often systems change.

The HPE BladeSystem Solution

Solving for today's infrastructure demands means attacking the new realities described above on multiple levels. Every element of infrastructure must be part of the solution. Compute, storage, databases, and networking all have to contribute to making infrastructure more responsive to rapid change. The way those infrastructure elements interact with each other must change, along with the overall approach to infrastructure management.

HPE devised the newest generation of its HPE BladeSystem servers and the accompanying HPE OneView management platform to help infrastructure managers streamline and accelerate every step of IT operations. Figure 4 shows the HPE BladeSystem c7000 enclosure, a building block architecture that can fit 16 half-height server blades or 8 full-height blades into a dense form factor tackling the most demanding workloads including virtualisation, VDI and scale-up.

HPE OneView manages the entire infrastructure lifecycle efficiently. It makes resource design, provisioning, monitoring, and updating possible through a single interface. It helps eliminate time-consuming, manual processes and rigid silos with software-defined intelligence that makes configuration faster and easily repeatable.

Together, HPE BladeSystem and HPE OneView effectively form a single, converged infrastructure and management platform. Converged infrastructure groups multiple IT elements in a single, optimised package.
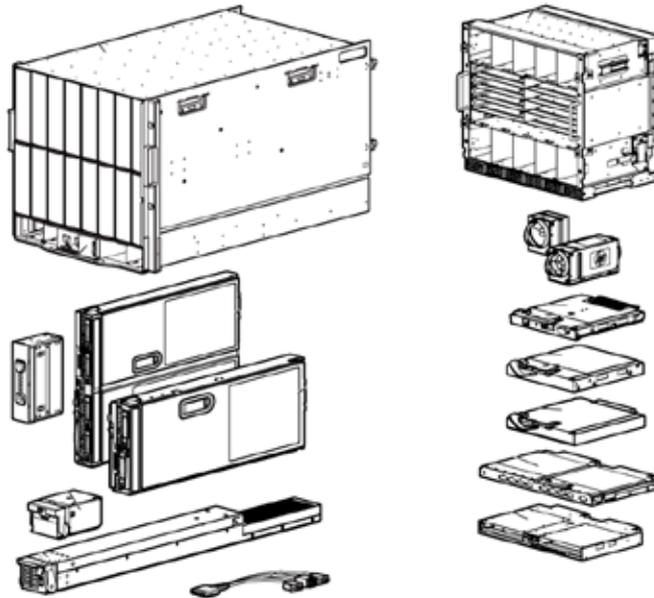
Figure 4 – The HPE BladeSystem c7000 Enclosure features a building-block architecture that can hold full and half-height server blades. The effect is to pack a substantial amount of compute, storage, and networking capability into a dense form factor. http://www.hp.com/ctg/Manual/c00698286.pdf

Converged components include servers, data storage devices, networking equipment, and management software. HPE BladeSystem and HPE OneView integrate to address the deployment, scaling, and reconfiguration challenges of today's infrastructure by automating management tasks and using software defined intelligence, a unified API, and a converged architecture. This combined power is one of the reasons Gartner named HPE a leader again in the 2016 Gartner Magic Quadrant for Modular Servers.

- **Software-defined intelligence** - Using template-based automation, it's possible to build repeatability into the provisioning and updates of compute, storage, and fabric resources. The effect is to reduce reliance on manual processes and disruptive maintenance operations, speed up the IT management process, and cut down on human errors.

- **Unified API** -The unified API in HPE OneView controls resources programmatically, making it possible for infrastructure managers to compose and manage physical infrastructure with code. A single line of code can fully describe and provision the infrastructure required for an application. This single interface enables

discovery, search, inventory, configuration, provisioning, updating, and diagnostics of infrastructure. The API ensures seamless interoperability with other management tools and connects with numerous partner technologies. These include development tools like Chef and Docker as well as cloud solutions such as HPE Helion and Microsoft Azure.

An Information Security Advisor, CISO & CIO at a tech services company commented on the impact of Unified API, saying, "Its modern interface and state-of-the-art Representational State Transfer (RESTful) web application program…goes far beyond the old-fashioned way of management platforms. Many companies have management point products, but nothing like OneView."

- **Converged Architecture** - HPE BladeSystem features a building block architecture. Blades come as composable blocks of compute, storage, and network fabric. The building block approach makes it simple to scale infrastructure: it reduces the typical complexity of configuring and separately scaling compute, storage, and networking piecemeal in traditional infrastructure.

How HPE BladeSystem Customers are Getting the Job Done

ITCentralStation.com carries reviews of IT products from experienced users. Writing about HPE BladeSystem and HPE OneView, ITCentralStation.com reviewers noted that an integrated, converged infrastructure platform was able to address many of today's most serious infrastructure challenges. The following review excerpts capture how IT professionals are using HPE BladeSystem and HPE OneView to achieve results in their respective organisations.

Consolidation, Efficiency and Ease of Use for Continual Improvements

Datacentre space is at a premium. Managers are also always seeking ways to reduce datacentre operating costs. With astronomical investments needed to add space (if it's even possible), IT managers are pleased when they can get more compute and storage capacity into existing racks. HPE BladeSystem makes this possible, as a Director at a real estate law firm discovered: "High consolidation and density was achieved with a single c7000 enclosure and 8 [HPE ProLiant] BL460c G8 series servers that took over the workload of 8x 42U cabinets previously used for processing workloads," he says. "In combination with Flex-10 and Flex-Fabric technology, we managed to reduce our 8x cabinets into just 1x 42U cabinet, saving huge amounts on power and energy, while we became more flexible, scalable, and efficient."

DENSE / CONSOLIDATION
EFFICIENT / FAST DEPLOYMENT
INNOVATIVE / CONTINUOUS IMPROVEMENT

Figure 5 – HPE BladeSystem is dense, efficient and innovative, enabling continuous improvement in infrastructure while reducing datacentre resource usage.

IT-staff time is at a premium and IT managers favour infrastructure solutions that are efficient to deploy. "We replace old systems with these Blades because they're easy to configure and are immediately usable upon installation," says a System Administrator at a large financial services firm.

An Active Directory Specialist at a manufacturing company with 1000+ employees echoes this sentiment, commenting, "With [HPE] blades, it's a lot simpler for us to deploy, expand, and virtualise."

Datacentre managers generally seek to make continuous improvements in their infrastructure to stay ahead of the curve. On ITCentralStation.com, an IT Manager at a health, wellness, and fitness company described how he is continuously able to innovate and improve their product set. He says, "HPE BladeSystem has been proven to be the best in the market in terms of blade systems, moving with every generation, and you can see that when firmware updates are released. Any lags/issues are always resolved and more features are added and enhanced."

Redundancy and Uptime

HPE BladeSystem enables redundancy, helping infrastructure managers ensure the level of uptime expected today. According to an ITCentralStation member who serves as a Director of Infrastructure & Service Management at an energy/utilities company, HPE BladeSystem means, "One system can go down and the other is still fully functional, which has given us the ability to withstand an outage we wouldn't have been able to before...We have been extremely stable." Another user, a Chief Information Officer at a thousand-person government agency, describes his uptime experience with HPE BladeSystem by saying, "It's improved our operation and efficiency with its great uptime. ...We're able to add as much as we can to it without worrying about it going down." An ICT Infrastructure Architect at a communications service provider adds, "Running

**REDUNDANT
STABLE**

**CONNECTIVITY ALERTS
PERFORMANCE ALERTS**

Figure 6 – HPE BladeSystem repeatable, fast-deploy architecture and built-in monitoring and alerting make possible a high level of redundancy and uptime.

HP Blade C7000 and BL460… It makes things in our organisation run more efficiently and with less interruption when we run the BladeSystem … HPE is stable and reliable."

Being aware of issues before they become problems is a factor in ensuring uptime. In this context, users also praise HPE BladeSystem's monitoring and alerting features. An Enterprise Monitoring Specialist at a financial services firm says the HPE BladeSystem, "enables us to capture any physical server alerts when there's any issue with health or change in connectivity status of the servers. It catches physical issues with the servers and will fix them, if possible, and, if not, alerts us before they become a problem."

Scalability

ITCentralStation.com members who use HPE BladeSystem have found that infrastructure that runs on the platform is able to scale with relative ease. A Senior Infrastructure Engineer at a software R&D company described the importance of scaling on the way HPE BladeSystem helps him meet the requirement. He says, "I think the most valuable feature for us is probably the ability to expand and change, such as adding servers. If anything goes down, they can be changed out quite easily, which to me is a very, very good thing. It's easy to

install, maintain, and expand." The Head of Production Service Delivery at a large financial services firm described how HPE BladeSystem scales in his world. He notes, "We have a thousand servers and five thousand users, so in terms of scalability, yes, it's been scalable and we're able to expand more if necessary."

Flexibility, Speed and Agility

Today's accelerating infrastructure-change curve translates into a need for flexibility at the datacentre level. HPE BladeSystem rises to the occasion.

A Co-Founder at a tech services company explained it like this: "We're very satisfied with the system. I'm a Linux administrator and we quite enjoy the flexibility of the blade system. We're using different blades for different load purposes. We can decide if we want to use storage blades for storage or we can use compute modes for compute performance, and you can also upsize them. You can even combine different blade servers for greater effectiveness."

The Active Directory Specialist at a manufacturing company remarked how his team makes use of HPE BladeSystem's inherent flexibility. He says, "The biggest improvement to our organisation is that we can now expand our IT

STORAGE + COMPUTE

NEW CONFIG + UPSIZE

RECOMBINE + ADD IT ASSETS

Figure 7 – HPE BladeSystem's flexibility makes it suitable for multiple workloads, with managers able to change workloads on blades relatively quickly and easily.

infrastructure easily. We can seamlessly implement additional IT assets if we want, whether that's to execute different plans or to remain consistent in our operations. We can change things as we need to as we go along…."

HPE BladeSystem is flexible enough to enable new IT strategies. As a [Lead Architect of Infrastructure](#) at an energy/utilities company commented, "It provides us with connectivity, saves us rack space, and enables us to have mobility for bring-your-own devices enabled by Microsoft." Continuing on this theme, a Solution Architect at a logistics company with 1000+ employees added, "We're able to provide a platform where we can start offering services back to the various groups within our organisation and our external customers as well."

The Path to Composable Infrastructure

HPE BladeSystem, together with HPE OneView, is positioned to put datacentres on the path to Composable Infrastructure, the next generation of the infrastructure-change curve. Composable Infrastructure enables datacentre managers to assemble infrastructure as needed quickly, for any workload, using powerful software and fluid pools of IT resources. A composable infrastructure allows IT to assemble and disassemble blocks of disaggregated compute, storage, and fabric infrastructure. HPE BladeSystem is built to serve as these converged building blocks. In this way, HPE BladeSystem makes possible optimal resource utilisation and cuts down on overprovisioning and stranded capacity.

- Optimise applications and reduce CapEx by running HPE BladeSystem as a single converged infrastructure with physical and virtual compute, storage, and fabric.

- Automate control of infrastructure, flexing HPE BladeSystem infrastructure up and down with simplified HPE OneView profiles.

- Increase productivity and control across the datacentre by integrating and automating HPE BladeSystem resources through a unified API.
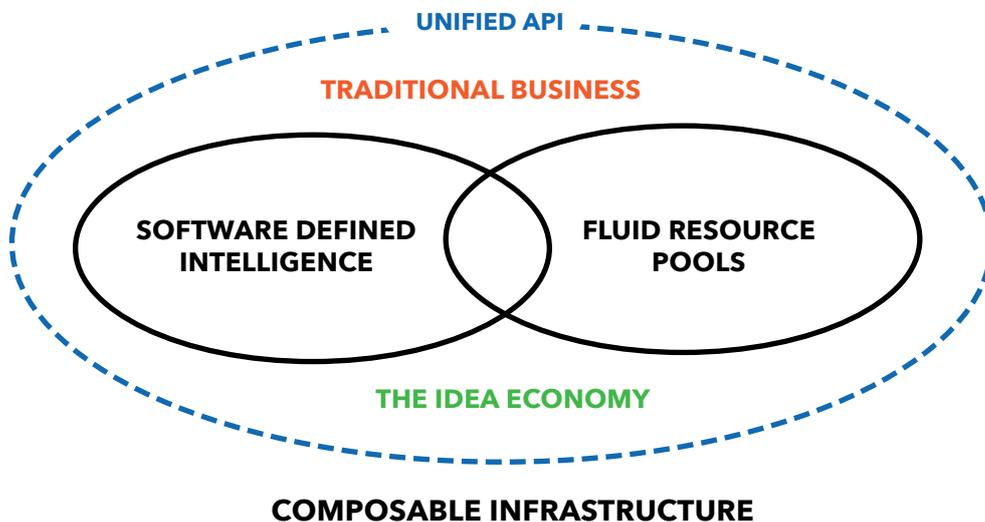

Figure 8 - Composable infrastructure brings together software-defined intelligence, a unified API, and fluid resource pools to meet fast-changing IT-workload needs.

Conclusion

The infrastructure-change curve is accelerating, but infrastructure capabilities can keep IT ahead of the curve. Business expectations now include standing up and modifying infrastructure with extreme rapidity. HPE BladeSystem together with HPE OneView provide a single platform that meets the infrastructure-change curve head-on, creating a new experience in which it's possible to assemble and modify infrastructure more or less on demand, in step with changing business requirements. Infrastructure flexibility and scalability increase. Redundancy and uptime become easier to attain. Datacentre resource usage grows more economical through a dense, building-block form factor powered by software-defined intelligence. As organisations grow even more demanding, HPE BladeSystem, together with HPE OneView, is a step toward composable infrastructure providing the path with the resources to address an even more rigorous infrastructure-change curve. For more information, visit hpe.com/info/bladesystem.

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