



Executive Insight paper

Commissioned by



# Taking vSphere into the future

Which route – Converged,  
Hyper-converged or DIY?

Freeform Dynamics, 2019

---

### About this Document

The insights presented in this document are derived from ongoing independent research, coupled with specific briefings from Fujitsu on their integrated stacks delivered under the PRIMEFLEX brand. While specific technologies are used to illustrate how key generic principles translate to practical reality, nothing in this paper should be taken as a validation or endorsement of any product or supplier.

---

---

*Organizations have accumulated multiple vSphere systems over the years.*

---

---

*Virtualization platforms are key to the future of software and services.*

---

## A virtual(ized) world

In the 20 years since VMware was founded, the virtual machine – and indeed virtualization generally – has become a standard part of enterprise IT infrastructure. Sure, there had been virtual machines (VMs) before, on a wide range of platforms, but it was VMware that took the concept mainstream as far as the Windows and Linux x86 server market was concerned.

By the time it was 10 years old, VMware had found a wide range of use cases, and of course it had more rivals, as others attempted to imitate or improve on it. But that was a decade ago and since then it has also become ‘part of the furniture’ of IT, the sort of thing you forget about until it breaks, or until you run out of physical resources. VMware and its vSphere platform made this kind of infrastructure thinking even easier with tools such as vMotion, allowing you to treat the hardware as a resource pool and move VMs between servers almost seamlessly.

The result is that many organizations have accumulated a variety of vSphere hardware hosts – of varying ages and architectures – over the years. Now, with the constantly growing demand for VM hosting and the addition of important new requirements and services such as container hosting, you are very likely to be looking not just for more server capacity, but also for simpler management and of course more automation across the board.

## Virtualization and the future of IT

For most organizations, there is a temptation to allow new ‘future of IT’ technologies and concepts, such as containers, microservices, serverless computing and hybrid cloud, to drive their plans for data center modernization. However, while these next-generation platforms might be ideal for new services, your existing core business applications are what your organization relies on today, and will still be reliant on for some time to come.

Those core applications have probably been virtualized over time on an ad-hoc basis. They could now be re-architected, but that takes time and may be disruptive and costly. They could instead be moved to a cloud platform, but again that can be disruptive, and in any case the cloud will not suit all needs or all business cases.

## Adding containers and more to the mix

Understand too that, as you move into the ‘as-a-Service’ world of Cloud Foundry, Kubernetes, OpenShift, serverless and so on for your next generation of systems and services, this does not remove the need for virtualization – quite the reverse in fact. This is because many container-based platforms actually run on top of VMware or another virtualization platform. So just as the mainframe never went away despite the many predictions of doom, neither will the ongoing need for virtualization platforms.

The question then is, given that virtualization platforms are almost certainly going to remain a big part of our IT landscape, how do we avoid the pain and costs of maintaining older hardware and software platforms, whether by design or by accident? And how well will our long-lived VMs – and new ones – fit in with our chosen new architecture going forward?

The task, then, is to find a modernization and consolidation route that is inclusive. In other words, it should ideally support both your current and future VMs, and also new and re-architected services running in containers or as microservices as part of an evolution to hybrid IT.

## Making a business case for modernization

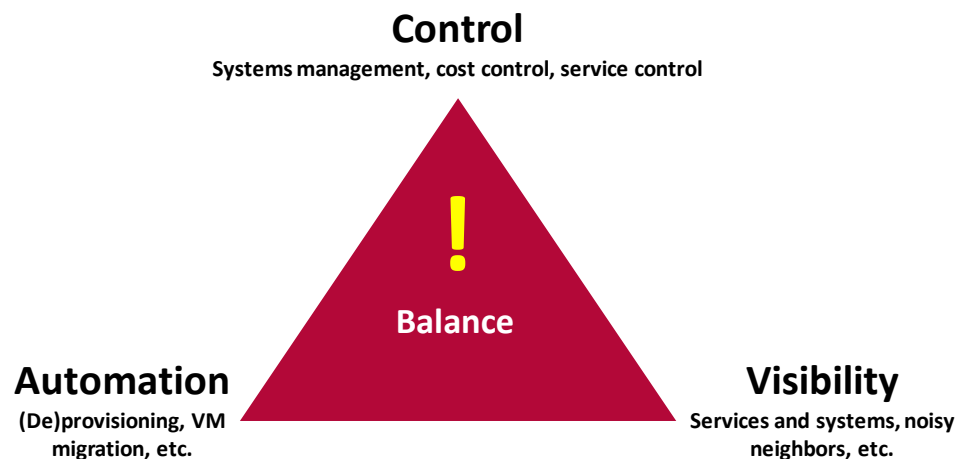
We tend to think of virtualization as mature and 'settled', but a lot has changed since it broke through into the mainstream. Server hardware has evolved considerably of course, for example in areas such as reliability and high-availability, but so has the associated software. In particular, system monitoring and management capabilities have been greatly enhanced, simplified and automated, for example to provide visibility into which processes or services negatively impact others by their excessive consumption of resources (noisy neighbors).

And perhaps most importantly of all, remember that with vSphere – or any other virtualization platform – the very nature of the VM means that infrastructure decisions such as consolidation can be abstracted from service decisions. You might (or might not) need to redesign and rebuild your core applications in the future, but that can be decided when time and resources permit. For now, the key thing is to get them onto a stable, modern footing.

By 'modern' in this context, we refer not only to the hardware and software, but also to the management and monitoring capabilities mentioned above. In particular, that's the triad of control, automation and visibility. Each of these is essential, but prioritizing one over the other two will tend to tilt the resulting platform out of balance (Figure 1).

*For now, the key is to get your core apps onto a stable, modern basis. Re-architecting can then be done when time and resources allow.*

Figure 1  
The control/  
automation/visibility  
triangle



## Assess your current infrastructure

An essential first step is to look at your key systems and ask how old they are – six or seven years, perhaps? Were they originally home-grown systems, put together on an ad-hoc basis, and are they consolidated and consistent, or a mixed bag? Are they running the latest version of vSphere, or are they on an older release because of resource constraints, upgrade fears or compatibility problems? And do they incorporate older processor chips that lack the latest manageability and virtualization extensions?

*'Well, they still work' is a bad reason for keeping old systems, especially when better and less risky options are available.*

---

*Outdated or overly complex systems may bring unacceptable levels of technical, business and legal risk.*

---

If the answers to any of these questions ring a bell, it should not be too surprising: humans are creatures of habit, after all. If something works for now, we are likely to carry on doing it or using it for as long as possible. As the popular saying goes, “If it ain’t broke, don’t fix it.”

The danger is that these behavior patterns may (subconsciously) ignore economics or risks. Perhaps the additional management overhead and maintenance expense that they require is not properly figured in as a cost because “it’s just the way things are.” Or while the platform is not visibly broken, its complexity or its outdated hardware and software have introduced unnecessary risks and constraints.

And risk in particular is not just technical or business-related, it can involve legal penalties too. For example, if you lose or expose personal data, the tests that data protection regulators will use to determine your degree of culpability can include assessment of whether or not the technical and procedural protections were “state-of-the-art.”

## Building the future

If your current infrastructure or your Do-It-Yourself (DIY) strategy do not give you the control, automation, visibility and protection from risk that is needed to move forward, and if there’s no good business case for moving to the public cloud, then there are two options for developing and building a consolidated, modern, consistent and scalable platform: classic converged infrastructure (CI) or hyper-converged infrastructure (HCI).

## Hyper-converged vs Classic Converged

While there are considerable similarities between these approaches – most notably that they both involve converging the compute, networking and storage elements within a single management layer – there are also significant practical differences. One way to envisage these is as the difference between the archetypal black box and white box approaches to building appliances.

**Hyper-converged Infrastructure (HCI)** is a “black box”, designed to operate as a single unified system with little or no visibility into what happens behind the scenes. Compute, storage and networking functions all run – in virtualized form of course – on the same server. Automated controls arbitrate between them, assemble VMs on demand and so on.

It is primarily a scale-out approach and can be an excellent fit for workloads that scale horizontally, with compute and storage resources growing in parallel. For example, there are use cases which require processor capacity, main memory and disk space in ‘fixed blocks’, such as Virtual Desktop Infrastructures (VDI) and terminal server deployments. HCI may be delivered as an appliance, or less commonly as software to install on your choice of hardware.

Less appropriate for HCI are monolithic applications, which can cope with increasing data volumes only using a vertical scale-up approach. In addition, there are still applications which run best on bare-metal because a virtualization layer would slow them down. Similarly, most HCI systems are designed around a specific hypervisor, so they may not be an option where multiple hypervisors are required.

---

*HCI is a scale-out approach, good for some workloads but less appropriate to monolithic platforms or applications.*

---

---

*A key objective for converged infrastructure is to drive repeatability and control.*

---

**Converged Infrastructure (CI)** is more of a “white box” approach. It too integrates network, storage and compute into a single centrally managed system, complete with orchestration and life cycle management software. However, the hardware components are separate devices, which means it is possible to scale up as well as scale out.

As well as hosting VMs, CI can be deployed as bare-metal if need be. It can take the physical form of a preconfigured appliance, or a reference architecture (or blueprint) for the set-up and centralized management of a consistent and scalable infrastructure. With CI, you can drive repeatability and control further than would be possible with the typical DIY strategy.

Like HCI, converged systems are typically supplied, warranted and supported by a company, so you have a single point of contact. This also means that system integration problems should be a thing of the past, because the components have already been specified, tested and configured to work together.

You will be limited to whatever range of parts your CI supplier offers, of course, but even so, this type of hardware integration still allows at least as much structural freedom, configuration control and granular expansion as HCI does. These are important factors when it comes to supporting platforms such as vSphere, where we need flexibility, control and scale-up.

## Key requirements

Working from the discussions above, let’s look at the considerations that emerge when deciding which route to choose. First, our modernized systems must not only be able to re-home or re-platform existing VMs, they should also offer PaaS support for future container and microservices-based applications. They may also be required to provide bare-metal support for applications that cannot easily be run in a virtualized environment.

They should also be simple to automate, manage and monitor, and be significantly lower-cost to own and operate than the systems they will replace. Based on those expectations, we can list some key requirements in terms of hardware, software and support:

- Fully integrated stack;
- Fast and easy implementation, with a single point of contact for purchase, warranty and maintenance;
- Scale-up as well as scale-out, as growth rates can vary dramatically;
- Independent functional expansion using standardized and preconfigured modules or elements;
- Integrated, standardized and centralized management and monitoring.

Given the above, and taking a long-term view, self-build or DIY may still be appropriate in exceptional cases, but converged or hyper-converged infrastructure will provide a better fit most of the time.

Whether you choose CI or HCI will then depend on the relative importance of these checklist items to your specific organizational needs and application mix. For instance,

---

*Our modernized systems must not only re-home existing VMs, they should also offer PaaS support for containers and microservices.*

---

in the case of vSphere you will want to consider its likely need for scale-up, and for the ability to add more storage or compute power independently of each other.

## Example: PRIMEFLEX for VMware vSphere

As an example of a converged infrastructure, and to show how an organization could use it both to host new services and to consolidate and modernize existing VMware-hosted applications, we will use PRIMEFLEX for VMware vSphere from Fujitsu, the sponsor of this paper. While nothing we say here should be interpreted as an endorsement or recommendation of this solution, talking around a specific offering like this enables us to move beyond the theory, and illustrate how some of the key principles we have been discussing can be translated into operational reality.

---

*PRIMEFLEX brings a fully integrated hardware stack from trusted sources.*

---

**Fully integrated stack:** The first important checkpoint with any converged system is that all the components – both hardware and software – must have been configured and thoroughly tested to operate together. This requires experienced suppliers and a known set of components. For instance, each PRIMEFLEX for VMware vSphere system integrates Fujitsu PRIMERGY RX servers with ETERNUS storage, also from Fujitsu, IP switches from Extreme Networks (with the option also of Broadcom Fibre Channel switches), and of course VMware vSphere software. This is a well-established combination of enterprise class components and software from trusted sources, pre-tested and validated before shipping.

**Fast and easy implementation, with a single point of contact for purchase, warranty and maintenance:** Speed and ease of implementation can be achieved with CI as long as it meets other key expectations, most notably the requirements for standardized, integrated management and a single point of contact for supply and support. The PRIMEFLEX systems achieve this by integrating all their components under Fujitsu's Infrastructure Manager (ISM) software and by providing holistic support from within the company's extensive technical support umbrella.

**Scale-up, as well as scale-out, as growth rates can vary dramatically:** This is an area where CI can offer advantages over the modular HCI approach. Sure, the growth requirements of some applications can be met effectively via scale-out. However, VMware vSphere requires a platform that can also scale-up. CI systems such as PRIMEFLEX for VMware vSphere are highly scalable and expandable, allowing you to increase the capacity and capability of the hardware platform. Its components can be swapped for more capable or powerful ones, or more capacity linked in from elsewhere in the data center (within the limits imposed by the hardware suppliers and the platform itself, of course).

---

*Converged Infrastructure has notable advantages where scale-up is needed.*

---

**Independent functional expansion using standardized and preconfigured modules or elements:** As the total workload grows, you may require more compute power, system memory, storage or network bandwidth. Converged infrastructure such as PRIMEFLEX for VMware vSphere can be both appropriate and cost-effective here. Because it is converged from individual elements, those elements can be scaled independently. Need more storage? Add more, with no need to add unneeded extra compute and network capacity at the same time.

**Integrated, standardized and centralized management and monitoring:** Converged systems such as PRIMEFLEX for VMware vSphere are handed over not just with vSphere ready to run, but with tailored end-to-end services plus management software that covers the full stack – as mentioned, in this case that's Fujitsu's ISM.

---

*Powerful and effective management software is essential to any converged infrastructure.*

---

Comprehensive and effective management software is an essential element of any converged infrastructure, because it is how you achieve and simplify those three necessary tasks of control, automation and visibility. So we see for example that ISM provides centralized control of the whole data center – that’s servers, storage and networking – through a single user interface. More significantly, it provides that level of simplification and automation both for existing application environments and new ones.

The consequence is that, once it has been installed in the data center, a PRIMEFLEX for VMware vSphere system is largely a hands-off affair. As discussed above, system expansion is then possible either within the system (scale-up) or by tightly clustering it with another PRIMEFLEX for VMware vSphere converged system within the same ISM management environment.

## In conclusion: The future is hybrid IT

It’s taken some of the public cloud providers a few years to acknowledge it, but not everything will or should move to cloud, whether public or private. In other words, traditional IT – a term that now also embraces VMware vSphere and other key virtualization platforms – is not going away any time soon.

---

*Older services may still be extremely important, so it is essential to keep the underlying hardware as up to date as possible.*

---

Most organizations will continue to use traditional on-site and hosted technology alongside shared services such as public cloud, SaaS and so on. Yes, there may be opportunities and good reasons to “lift and shift” some on-site applications into the cloud, or re-architect them to be cloud-native, but at the same time, many of us will have equally good reasons to pull down apps and services from a public cloud and run them on-site.

Old infrastructure ages and becomes both less cost-effective and harder to maintain and manage. Yet at the same time, older services may still have extremely important roles to play – they are not just waiting for decommissioning. Virtualization allows us to abstract the service from the infrastructure. We can now reduce complexity by modernizing the infrastructure and the platform, turning off the old infrastructure as it is replaced.

The interesting thing about the likes of VMware is that as well as running your organization’s current applications, your virtualization platform is also your stepping stone to the future. That’s because it is also both a vehicle to shift applications into a cloud if need be, and the infrastructure – to start with, at least – for your container-based and cloud-native services.

---

*Your virtualization platform is also your stepping stone to the future of services.*

---

All of which makes it essential that you keep the underlying hardware platforms as consolidated, consistent and up to date as possible. If you don’t, you risk swapping the platform management gains won with virtualization, for infrastructure management losses, in terms of the added overhead associated with maintaining and managing a mish-mash of hardware and software.

## About Freeform Dynamics

Freeform Dynamics is an IT industry analyst firm. Through our research and insights, we aim to help busy IT and business professionals get up to speed on the latest technology developments and make better-informed investment decisions.

For more information, and access to our library of free research, please visit [www.freeformdynamics.com](http://www.freeformdynamics.com) or follow us on Twitter @FreeformCentral.

## About Fujitsu

Fujitsu is the leading Japanese information and communication technology (ICT) company offering a full range of technology products, solutions and services. Approximately 155,000 Fujitsu people support customers in more than 100 countries. We use our experience and the power of ICT to shape the future of society with our customers.

For more information on PRIMEFLEX for VMware vSphere, please visit [www.fujitsu.com/pf4vv](http://www.fujitsu.com/pf4vv).

## Terms of Use

This document is Copyright 2019 Freeform Dynamics Ltd. It may be freely duplicated and distributed in its entirety on an individual one to one basis, either electronically or in hard copy form. It may not, however, be disassembled or modified in any way as part of the duplication process. Hosting of the entire report for download and/or mass distribution by any means is prohibited unless express permission is obtained from Freeform Dynamics Ltd or Fujitsu. The contents contained herein are provided for your general information and use only, and neither Freeform Dynamics Ltd nor any third party provide any warranty or guarantee as to its suitability for any particular purpose.