# HPE and VMware drive SDDC innovation

Converged server, storage and network architecture improves capacity management in cloud data centers

Any business knows it needs to run a tight ship to maintain a competitive edge and fine tune profitability, but operating at maximum capacity on minimum resource is a difficult balancing act.

On the one hand, organizations need an IT service infrastructure that can deliver fast, reliable and secure data and application access to demanding end users, whilst simultaneously supporting production workloads that keep the business running. But on the other, that infrastructure must also be cost effective, unhindered by poorly utilized hardware that takes too long to provision and is expensive to manage and maintain.

Meeting those two requirements can be problematic, especially in data centers where resident server, storage and network architecture has evolved gradually over decades through a succession of upgrades to legacy hardware and software which have delivered only incremental performance benefits. This has left few companies best equipped to power the flexible private/hybrid cloud hosting platforms that are fast becoming the go to model for enterprise IT service delivery.

Research company IDC recently highlighted infrastructure modernization as a key contributor to digital transformation, which requires IT departments to move away from complex, siloed architectures to pool resource platforms and cloud service provision. Yet it estimates that only a third of organizations are adequately prepared to make a successful transition to the digital age.

"To support and deliver change, CIOs need to target elements of the infrastructure that are getting in the way of delivering agility, predictability and quality, rethinking the way they build and run IT." – IDC

## SDDC provides modern converged approach

Pioneered by VMware, the software defined data center (SDDC) delivers that infrastructure modernization by extending the virtualization concepts of abstraction, pooling and automation from computing to storage and network resources hosted on standard x86 servers.

At its core SDDC combines three previously separate areas of virtualization — server, storage and networking — together under a single unified architecture which can be tied more closely to individual application and service workloads to maximize resource utilization. And it is that convergence which is the key to delivering greater flexibility in terms of provisioning, management and resilience than were possible if those three pools of resources were handled in isolation.

HPE eliminates those siloes by integrating CPU, memory, storage and network infrastructure into a single chassis — HPE Synergy — which is controlled by an intelligent management software interface (HPE OneView) to offer a range of flexible infrastructure configurations for different sized data centers.

And by combining that composable architecture with the VMware Cloud Foundation (VCF) cloud platform — an integrated software stack that gives organizations the ability to rapidly provision and run SDDC environments — Synergy offers a single integrated SDDC solution built on the best of the two companies' data center hardware and software.

Each Synergy chassis features 12 half height modular bays that can be installed with up to 12 HPE ProLiant Gen10 servers and four storage modules each containing 40 local hard drives, for example. Those resources can be mixed and matched to meet individual business needs, and the virtual pools of CPU, memory and storage resources created can be scaled up and down independently of one another to meet fluctuating requirements. The modular approach allows data centers to create entry-level storage or compute intense configurations best suited to their application delivery model and expansion plans.

## Synergy and VCF provide simplified provisioning and control

VMware cloud foundation provides a standardized, best practice architecture out of the box, that means there is no complicated set-up or configuration.

Data center operators get significantly streamlined management capabilities — the ability to manipulate all three pools of resources from a single console screen. But greater automation of the processes and transactions required to get virtualized workloads up and running is also a central part of the proposition. Automated provisioning is managed by a framework of defined rules, policies and service level agreements, with an automation and orchestration engine, that configures the appropriate resources from the aggregated pool. That automation extends with VCF to include managing the operational lifecycle of the visualized software itself. Providing the capability to upgrade and maintain the platform with very low operational overhead.

Synergy also allows IT managers to automatically program and configure the granular physical hardware resources as virtualized pools of capacity that can be allocated to specific cloud-hosted applications or workloads on demand, thereby delivering the granular utilization that can push down the cost of their supply.

Most IT managers have individual preferences when it comes to the systems and infrastructure management tools they use, based on a combination of personal inclination and what they have experience in using previously. Synergy offers a range of different options here.

One is HPE OneView, which allows IT managers to quickly build a standard workload configuration using a series of easy to use templates. And its support for a unified application programming interface (API) lets Synergy automate each necessary hardware and software configuration all the way from the firmware and BIOS, to the storage area network connectivity and operating system deployment.

## Unified API supports VMware VCF integration

That unified API also allows IT departments to deploy VCF on top of OneView to manage the operational functions of the underlying SDDC components.

VCF combines VMware's virtual CPU, storage and networking tools into a single integrated software stack that can be deployed either on-premise as a private cloud, or run from a public cloud platform as part of a broader hybrid cloud deployment. It comprises three software components — vSphere (compute), vSAN (storage) and NSX (networking) — which have been widely deployed by enterprise data centers over the last five years as a foundation for SDDC migration. Upgrading to the latest HPE Gen10 ProLiant servers and Synergy platforms now allows those data centers to use VCF for more efficient provisioning, configuration and management of virtual workloads in SDDC environments.

Because VCF has been tested and pre-certified for use on HPE Synergy, it can be installed quickly and capacity made available for production workloads in a shorter amount of time. The Virtual Connect elements within the Synergy chassis remove the need for top of rack network switches, with connectivity aggregated directly onto backbone devices. This helps reduce the volume of network equipment, cabling and interconnects required and leaves data center managers with fewer devices to configure, patch and maintain — another example of where the HPE Synergy and VMware VCF approach to SDDC can cut hardware maintenance costs.

## Data center security top priority

Data center security is increasing in importance for new infrastructure solutions, that is why the VCF/Synergy solution includes data encryption from the vSAN component.

In addition, running vSphere on ProLiant Gen10 servers provides data centers with further levels of protection designed to prevent unauthorized access to the information they store and process. That includes a hardware validated boot process designed to protect server firmware from being tampered with, which in data centers could involve employees, contractors and visitors, as well as external intruders.

Bootkit and firmware attacks can be difficult to combat because they penetrate the server before the operating system and security applications are loaded and are hard for traditional anti-virus/malware tools to detect. Various approaches to the problem have been implemented including the firmware-based Unified Extensible Firmware Interface (UEFI)

Secure Boot and the CPU embedded Trusted Platform Module (TFM), as well as proprietary on-chip solutions in the form of Intel's Trusted Execution Technology (TXT) and Boot Guard. None of these have been designed to provide ongoing runtime protection however, whilst they validate firmware code only when the server is started.

HPE's Silicon Root of Trust takes a different approach by making sure that server essential firmware code within ProLiant Gen10 systems has not been altered as soon as the server is powered on and the Integrated Lights-Out 5 (iLO 5) utility kicks in. The iLO 5 firmware then validates the rest of the server's firmware before the UEFI completes the chain through secure boot. Protection does not stop there — firmware verification is regularly conducted whilst the server is operational. If compromised code or malware is detected, alerts are generated and IT staff can initiate a recovery by reloading the last known clean copy of the server firmware.

On top of the enhanced hardware security found in ProLiant Gen10 systems, the latest version of VMware vSphere also includes options to encrypt data at the hypervisor, virtual disk and virtual machine level, which can be automatically configured through defined storage policies. There is additional support for the secure boot of VMs and single sign on (SSO) to tighten up user authentication. The automated collection of log/configuration data for operating systems, local desktops and vSphere Clients also provides an audit trail which can help pinpoint the source of any security breaches and help data center managers revamp their defences to prevent similar incidents from happening again.

## Conclusion

Learn more at:
**www.hpe.com/partners/vmware**

Efficient, business critical private/hybrid cloud service delivery is the key to an agile business and keeps it running in production. It will always depend on having resilient systems which are able to support fast and secure application and workload provisioning — something that instant, automatic boot-up of the underlying infrastructure and their respective hypervisor and virtualization platforms provide.

Those services also need to scale virtual capacity up and down on demand and optimize their utilization of underlying hardware if they are to support the cost effective, pay as you go consumption models demanded by the modern enterprise. A tried and tested SDDC platform based on the combination of HPE Synergy and VMware VCF gives IT departments those essential ingredients and a solid base for future cloud data center expansion.

## About Hewlett Packard Enterprise

Hewlett Packard Enterprise is a global technology leader focused on developing intelligent solutions that allow customers to capture, analyze and act upon data seamlessly from edge to core to cloud. HPE enables customers to accelerate business outcomes by driving new business models, creating new customer and employee experiences, and increasing operational efficiency today and into the future.
**Learn more: hpe.com**

## About VMware

VMware software powers the world's complex digital infrastructure. The company's compute, cloud, mobility, networking and security offerings provide a dynamic and efficient digital foundation to over 500,000 customers globally, aided by an ecosystem of 75,000 partners. Headquartered in Palo Alto, California, this year VMware celebrates twenty years of breakthrough innovation benefiting business and society.
**For more information please visit: https://www.vmware.com/company.html**

## About IDG Connect

IDG Connect is the demand generation division of International Data Group (IDG), the world's largest technology media company. Established in 2006, it utilizes access to 44 million business decision makers' details to unite technology marketers with relevant targets from any country in the world. Committed to engaging a disparate global IT audience with truly localized messaging, IDG Connect also publishes market specific thought leadership papers on behalf of its clients, and produces research for B2B marketers worldwide.
**Learn more: www.idgconnect.com**

In association with: