

REPORT REPRINT

HPE Synergy marks first 'composable infrastructure' products for new Enterprise division

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The recently formed HP Enterprise division claims its new modular systems architecture, embedded OneView management, and unified API pull together servers, storage and networking into fluid resource pools, simultaneously supporting traditional and cloud-native apps.

SECTORS

ALL / SYSTEMS / SERVERS / BLADES/RACKS

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Hewlett Packard Enterprise (HPE), which has been running as an independent entity since November 1, has launched the first of a new class of modular systems products it's billing as 'composable infrastructure.' HPE Synergy, aimed at enterprises and second tier cloud service providers, is intended to bridge the gap between traditional IT and newer approaches, such as private cloud, cloud-native and big-data applications. It does this by assembling the modular hardware resources into dynamic resource pools of compute, storage and fabric. And to manage it all, HPE has added a 'software-defined intelligence' layer based on its OneView converged infrastructure management tool and unified API, first introduced in 2013 and already used on its current ConvergedSystems. Synergy is due to become available in Q2 2016.

THE 451 TAKE

Like rivals IBM and Oracle, HPE has a large installed base of traditional enterprise customers used to highly engineered and highly reliable on-premises servers, storage and networking. Synergy will appeal to those looking to try newer styles of IT without ditching their tried-and-true existing practices. Hybrid cloud and continuous DevOps projects that stretch out to public cloud infrastructure are the likely early deployment cases. We assume that the embedded management approach to software-defined infrastructure used for Synergy will be adopted more broadly across the HPE portfolio over time.

CONTEXT

HPE has a longer history than most in this area – it began talking about 'adaptable infrastructure' as far back as 2000, when the first blade servers emerged. It's C-Class blade servers first came out in 2006, and had more provision than most for adding elements other than compute – an example was Virtual Connect, enabling more flexible allocation of networking resources between blades. The first ConvergedSystem products came out in 2011, running on either ProLiant or C-Class blade servers, depending on the application targets. These offerings were radically revised in 2013 with the introduction of OneView. Project Synergy and the term 'composable infrastructure' first began to be talked about as a future strategy in June.

TECHNOLOGY

Composable infrastructure (a term now also used by Cisco and Dell) relies on three technology elements: fluid pools of resources, software-defined intelligence and a unified API. The resource pools enable compute, storage and networking fabrics to be composed and recomposed to fit the requirements of an application – and this has to be done in near real time, on the fly, so that the infrastructure can be booted up ready for deployment when required. Physical (bare metal), virtual and containerized applications can all be supported. The software-defined-intelligence layer discovers and assembles these infrastructure components automatically, and enables repeatable, nondisruptive updates. Finally, the unified API enables the abstraction of every element of the infrastructure with a single line of code, so that the entire infrastructure becomes programmable and accessible from a single interface. It also provides a bare-metal interface for IaaS. Of course, there are some elements that could benefit from more granular composition, the most glaring being the separation of CPU from main memory.

PRODUCTS

The HPE Synergy 12000 Frame is a 10U enclosure with 12 zones for compute and storage nodes, and two appliance bays for embedded management nodes. There's a front panel for Synergy console connections and (at the back) six interconnect module bays (for three fully redundant fabrics: Virtual Connect Ethernet, FCoE or fiber channel), 10 fan bays, six power supplies, and two frame link module slots (to link multiple frames via a private management network). The compute nodes can be two (half-height node) or four (full-height node) Xeon E5 processors, or four (full-height) Xeon E7s. The HPE D3940 Storage Module, with up to 40 2.5-inch drives (12G SAS, 6G SATA HDD or SSD drives are all options), takes up two bays and can provide composable direct-attached storage for up to 10 compute modules in one frame. It's optimized for software-defined storage, including Scality object storage, StoreVirtual VSA, VMware VSAN, Microsoft Storage Spaces and Hadoop. HP believes that some of its key differentiators come from the networking fabric, which enables the elimination of top-of-rack switches, reducing complexity, improving performance and lowering TCO. A single pair of switches can be used for up to five frames.

The most obvious software integrations are already in place – Windows Server and primary Linux distros, VMware ESXi and vSphere, and popular automation tools like Chef and Docker – as well as HPE's own private cloud orchestration layers, such as Helion/OpenStack and Cloud Services Automation.

But perhaps the most significant new addition is Synergy Composer, implemented as an embedded management appliance and incorporating a full feature embedded copy of OneView. It's intended to provide a single interface for the composition and recomposition of logical infrastructures into any combination at near-instant speeds, cutting out overprovisioning, rescuing stranded capacity and matching the right amount of resources to each application, all of which should reduce capex. It's also used as a single interface for monitoring, rapidly deploying and updating infrastructure for traditional, virtualized and cloud environments. Workload templates define how the infrastructure needs to function, and the internal software-defined intelligence implements changes programmatically. Two appliances are usually implemented for redundancy purposes, and one pair of appliances can manage up to 20 frames. They plug directly into the frame to manage all Synergy resources through OneView profiles and templates, and work with existing server management standards such as ILO, IPMI and RedFish.

HPE Synergy Image Streamer is an additional management appliance that delivers rapid image/application changes to compute resources, the idea being that customers can save money by eliminating storage from compute nodes, thereby enabling faster deployments. Compute modules can be run in fully stateless mode if required. Image Streamer can be used for fast virtualized image changeovers, secure boot, personalization and compliance. It utilizes intelligence garnered from Composer to deploy and update each physical compute node with operating environments in near real time.

The primary benefits of this type of approach are the avoidance of overprovisioning, faster and more flexible delivery of infrastructure from IT to the lines of business, and easier integration access for developers and ISVs. Although figures vary, it's clear that, on average, servers are severely underutilized, with many using less than 20% of the available resources. This is effectively throwing money away. Through the pooling together of previously fragmented resources, HPE believes it can reduce overprovisioning by up to 60% and beyond, providing up-front cost savings of up to 17% and ongoing cost savings of 30%. Faster infrastructure provisioning and updating of servers, storage and networking comes from the application-specific software-defined templates and bootable images – customers get a library of prebuilt operating environment images from which a single admin can deploy resources to line-of-business staff much more rapidly. For developers and ecosystem ISVs, the unified API provides a single interface for discovery, search, provisioning, updating and testing, potentially cutting out weeks of custom scripting work. HPE also offers support-optimization services and finance options. Availability is Q2 calendar 2016, when pricing will be announced.

STRATEGY

Synergy takes a more modular approach than current HPE blade servers and adds a significant new management layer, more closely aligned to the hardware itself through its implementation as an embedded management module. Despite that close linkage, the software is essentially open and extensible, both by customers and by third-party vendors. HPE is encouraging an ecosystem of ISVs – and some IHVs – and has so far signed up Arista, Ansible, Chef, Docker, Microsoft, NVIDIA and VMware to join the HPE Composable Infrastructure Partner Program. The newly renewed Microsoft partnership, for instance, involves the launch of the HPE Hyper-Converged 250 appliance, preloaded with Windows Azure Pack, Windows Server 2012 R2 and HPE OneView for Microsoft System Center – for customers that want to use Azure technology for private and hybrid clouds. HPE will also sell on Azure's cloud service (in October, HPE discontinued its own Helion public cloud service). And there's an ongoing effort to integrate OneView and System Center more closely.

Since OneView is already a companywide systems management effort that spans multiple products, we wonder if the embedded appliance approach to management used in Synergy might be extended to standard ProLiant DL rack servers, and even other HPE hardware ranges, such as CloudLine (cut-down scale-out servers for cost-conscious service providers) and Apollo (HPC). HPE admits that Synergy represents just the first step to composable infrastructure. As we pointed out above, the separation of CPU and memory would add further flexibility and granularity, as would the ability to compose groups of CPUs into symmetrical multiprocessing clusters. Interestingly, this isn't the end of the C-Class blade servers – there's a new generation still under development.

COMPETITION

Cisco, Dell, EMC, IBM, Lenovo, Oracle and VCE are the primary competition for Hewlett Packard Enterprise, and the newly independent division is wasting no time pointing out that, while it has 'downsized' to become more focused, Dell and EMC are going in the opposite direction. (That argument may be countered by the likelihood of Dell taking up EMC's 'Federation' model, enabling individual divisions to compete and innovate, as well as partner with each other.) Cisco looks the closest, and it's also using 'composable infrastructure' as its tagline for the combination of the UCS M-Series modular server, stateless server model, disaggregated network I/O, virtual interface cards and fabric extender, and its management automation software. But one element it doesn't own is the storage – and HPE points to the multiple APIs that Cisco makes available as unnecessarily complex. Dell introduced its FX modular hardware some time ago, but so far at least, its management stack takes a less dynamic approach with minimal self-discovery reminiscent of blade servers and the first generations of converged-infrastructure products. Oracle puts most of its integration and optimization efforts into running its own software stack. HPE believes that VCE's focus remains virtualized infrastructure. Hyperconverged startup Nutanix is tightly focused on integrated compute and storage, and not on customers that want to keep their storage-area networks in place.

However, HPE will find itself competing more broadly with other software-defined efforts, including some overlap from partners such as VMware, from open source developments and from emerging startups such as Mesosphere. (HPE points out that there's no hypervisor in the HPE portfolio, and that it's open to working with multiple stacks). HPE's OneView approach has its similarities to dynamic configuration and provisioning tools for very large clusters deployed internally by the likes of Facebook (Kobald), Google (Borg) and Microsoft (AutoPilot) – the essential difference being that all of these were built from the ground up to support giant clusters made up of commodity servers.

SWOT ANALYSIS

STRENGTHS

A newly designed chassis was necessary as a foundation for providing fluid resource pools of compute, storage and fabric in near real time, but the software approach is where the main value lies, and there's room for further innovation.

WEAKNESSES

There are some elements that could benefit from more granular composition, the most glaring being the separation of CPU from main memory.

OPPORTUNITIES

Hybrid cloud and continuous DevOps projects that stretch out to public cloud infrastructure are the likely early deployment cases. Over time, the embedded management approach to software-defined infrastructure used for Synergy may be adopted more broadly across the HPE portfolio.

THREATS

HPE was early with the composable infrastructure term, but others are also using it. There's a race on between the giant systems vendors and virtualization providers to present customers with the most convincing software-defined datacenter.