

HPE DELIVERS PUBLIC SECTOR COMPOSABLE BENEFITS

HPE SYNERGY HELPS SIMPLIFY THE DELIVERY OF INNOVATIVE CITIZEN SERVICES

SUMMARY

Government organizations are continuing to see stagnant or reduced budgets with which to implement critical programs. IT systems are also typically antiquated and poorly utilized, further compounding the challenges that agencies and departments have in transitioning away from legacy datacenters. Historically, the majority of IT budget spend has been towards Operations & Maintenance (O&M). Thus, today's traditional IT infrastructure is not well equipped to improve on the cost structure for traditional workloads, nor is it optimized to deliver new constituent-centric services, improve citizen satisfaction, or increase operational effectiveness.

Hybrid IT, with its mix of on-premises and public as well as private cloud deployment is a logical next step in datacenter evolution. As one approach to address IT's changing demands, vendors are bringing to market solutions under a new category called composable infrastructure.

At a very high level, composable infrastructure is designed to treat hardware like software, allowing IT to manage "infrastructure as code". Infrastructure defined by software has the potential for significant efficiency benefits. Composability empowers IT to allocate the optimal set of resources—compute, storage, and networking / fabric—for each application. Vendors promoting composable infrastructure solutions claim this approach will deliver a cloud-like experience and superior economics with the control and security of on-premises infrastructure.

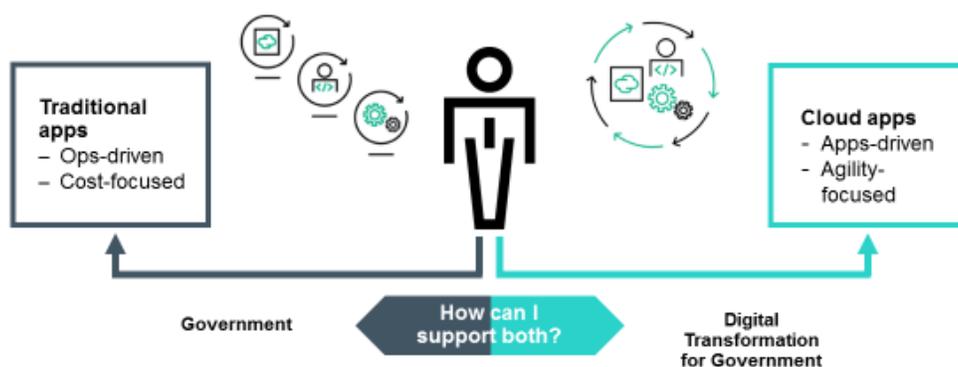
For public sector agencies, the architecture also meets "CloudFirst" objectives for lowering OpEx, but more importantly, it has the potential to better address shared service mandates while supporting the ability to fend off cyberattacks. For example, a "cloud for shared services" deployment in a federal government IT environment could take the form of flexing to provide more bandwidth for the IRS during tax seasonality peaks. A second deployment scenario could involve batching heavy computational runs for multiple agencies or collaborative efforts within government or academic research settings.

The composable infrastructure market is new, with Hewlett Packard Enterprise (HPE) and a few other leading vendors promoting solutions. Public agencies of all sizes could benefit from the architecture based on its cost management capabilities. Additionally, the nature of its fluidity allows composable infrastructure to scale from smaller agencies and commissions to branch and remote offices of larger constituent-facing departments. The architecture also facilitates one or more agencies to provision shared services and swap in and out specific batch or seasonal workloads. HPE has made a significant investment in composable infrastructure, software, and services and claims that hundreds of its customers are deploying HPE Synergy. This paper examines its impact on two public sector entities.

SUPPORT FOR TWO INFRASTRUCTURE MODELS IS UNSUSTAINABLE

Technology has become a key driver in today’s economy for both private and public sector organizations. At the forefront are the demands for introducing innovation and replacing aging infrastructure while balancing O&M spend to deliver core citizen services. To keep pace with the changing needs of constituent groups such as citizens, business, internal government employees, and external partners, HPE’s Synergy platform allows agencies to consolidate datacenters and offer shared services across multiple governmental organizations. Additional benefits are realized through the optimization of application deployment and reduction of operational inefficiency and maintenance.

FIGURE 1: HYBRID DELIVERY MODELS



(Source: Hewlett Packard Enterprise)

In the past, IT’s primary function was to support traditional applications designed to help automate existing agency processes as well as exhaust remaining budgets in a “use it or lose it” environment. Government IT organizations have also historically used a siloed approach to deploy traditional applications with a range of administrative

domains, application programming interfaces (APIs), complex processes, and an endless number of workload-specific hardware platforms. Decades of siloed IT management resulted in a proliferation of costly, over-provisioned infrastructure.

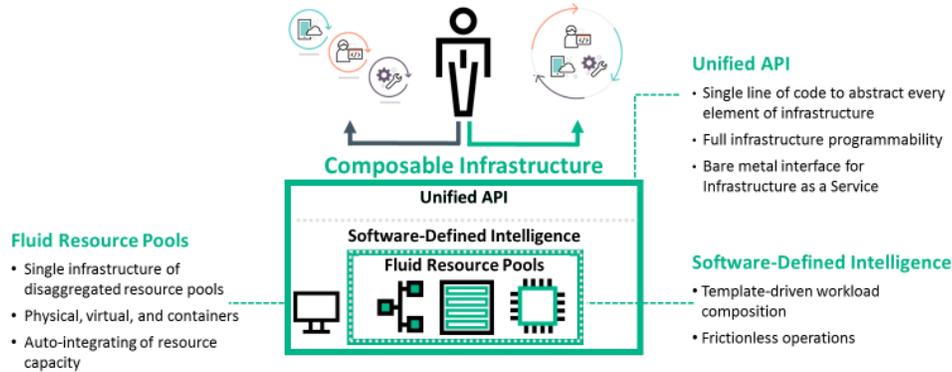
But now, in today's "Digital Transformation for Government", IT has the opportunity to transform its role from a support function to one of creating tangible value through improved efficiency and delivering better outcomes. One example is the growing emphasis around cybersecurity. As threats increase, governments will have to ramp their ability to defend against threats at a faster pace. Composable infrastructure, the backbone of HPE Synergy, has the power to bring fluidity to application and underlying software patches and updates for day-to-day cybersecurity defense through its dynamic provisioning of compute, storage, and network / fabric resources. Furthermore, it can facilitate cybersecurity apps to be developed and deployed quickly with the added ability to leverage data in real-time versus the static nature of traditional datacenter infrastructures.

Another advantage of composable infrastructure for public sector organizations is superior cloud-like economies of scale. If agencies are trapped by legacy environment silos and O&M budgetary consumption, the architecture has the potential to reduce the risk of rogue outsourcing. Historically, the outsourcing of governmental IT services has resulted in loss of control, inability to stay in compliance, and security breach risk.

COMPOSABLE INFRASTRUCTURE: DESIGNED FOR THE CHANGING IT LANDSCAPE

As one approach to address this major shift in application requirements, industry-leading public sector hardware vendors are bringing to market a new category of solutions called composable infrastructure. Moor Insights & Strategy (MI&S) defines composable infrastructure as fluid pools of resources that can be configured dynamically through software with an application of policy tuned to optimize application performance, then provisioned through a common API to drive the most efficient use of infrastructure. The National Institute of Standards and Technology (NIST) definition of cloud computing follows a similar construct. It specifies that cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable resources that can be rapidly provisioned and released with minimal management.

FIGURE 2: COMPOSABLE INFRASTRUCTURE ARCHITECTURAL DESIGN PRINCIPLES



(Source: Hewlett Packard Enterprise)

At a high level, composable infrastructure flips the hierarchical relationship between hardware and software. Composable infrastructure allows both agencies and third-party contractors the ability to deploy and manage hardware infrastructure resources using software commands (*i.e.*, infrastructure as code), instead of force-fitting applications onto static, siloed hardware. Infrastructure defined by software has the potential for enormous efficiency benefits. Composability empowers government IT to allocate the right set of resources—compute, storage, networking / fabric—needed to optimize each application’s performance

HPE distills the composable infrastructure architecture down to the following value proposition points in its [HPE Synergy for Dummies Guide](#):

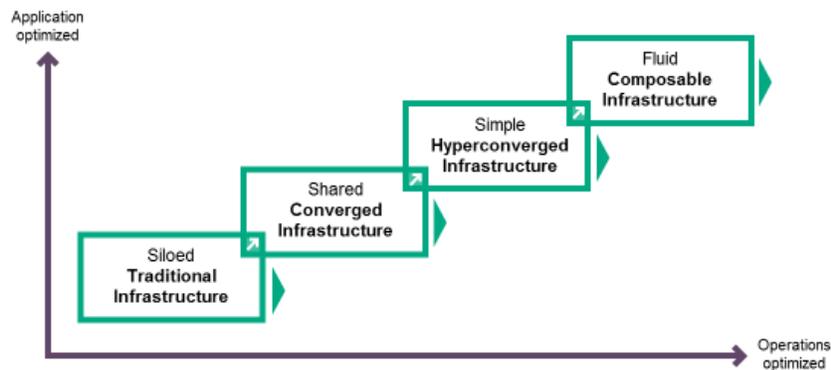
- Deploy quickly with simple flexing, scaling, and updating
- Run workloads anywhere: on physical servers, on virtual servers, or in containers
- Deliver CloudFirst objectives in reducing OpEx while providing shared services in an agile fashion
- Ensure the infrastructure can provide the right service levels, so agencies can deliver the best outcomes

The composable infrastructure market is new with a range of vendor solutions and approaches emerging. MI&S expects public sector organizations will increasingly adopt composable infrastructure over the next three to five years. Governmental datacenters will likely prioritize applications that could benefit from a self-service, flexible approach to application provisioning as the first to move to composable infrastructure, including a mix of both traditional and new applications in their deployment plans.

MULTIPLE PATHS TO COMPOSABLE INFRASTRUCTURE

Public sector entities that use converged or hyper-converged platforms are good candidates for a transition to composable infrastructure. These organizations are already familiar with the benefits of a single platform with server, storage, and networking / fabric resources and the efficiencies from an application-centric approach to resource deployment. Agencies that decide to take the next step to composable infrastructure from a converged or hyperconverged platform could experience additional benefits by pooling those resources and dynamically provisioning / re-provisioning their infrastructure as workload needs evolve.

FIGURE 3: DATACENTER INFRASTRUCTURE EVOLUTION



(Source: Hewlett Packard Enterprise)

A powerful argument for deploying a composable infrastructure solution in the public sector is program responsiveness. An agile program delivery could allow agencies to change and scale workloads rapidly in response to natural disasters, policy changes, and terrorist attacks. The architecture also has the potential to improve efficiencies and save money for agencies that have moved to private cloud deployments. For example, public sector entities using DevOps environments have recognized the benefits of deploying the specific resources needed to optimize application performance, and they have the tools in place to deploy and manage their applications efficiently. As the market evolves, these organizations may consider using composable infrastructure in a hybrid cloud model, potentially saving costs and gaining flexibility to deploy each application in a way that makes the most sense for the agency. HPE customer EMIS Health Group, a UK healthcare services organization, is deploying HPE Synergy to take advantage of rapid IT automation within a DevOps environment.

Because composability is a new concept for most governmental agencies, and each organization is starting from a different place, it will be critical for HPE to leverage its

global services organization and channel partners to provide expertise and guidance that customers can use to determine their best path to deploy HPE Synergy.

HPE SYNERGY: PURPOSE-BUILT FOR COMPOSABILITY

HPE Synergy is the first major bet from HPE in the composable infrastructure space and is one of the first platforms in the market that is purpose-built for composability. Its core customer benefits can be viewed through the lens of composable infrastructure design principles: fluid resource pools, software-defined intelligence, and a unified API.

FLUID RESOURCE POOLS

The HPE Synergy platform provides the fluid pools of resources—compute, storage, networking / fabric—required to implement a composable infrastructure environment. By allocating the right resources for each application, government IT can eliminate over-provisioning capacity, significantly lower CapEx, and increase operational velocity.

A key advantage of a composable infrastructure environment is that it can support both the requests for VMs and applications by agency and dev teams as well as dynamically provision for dev, test, or production environments. When the application need is no longer present, the HPE Synergy infrastructure can be unallocated and returned to its original stateless form as fluid pools of resources, awaiting the next request to provision infrastructure and applications.

SOFTWARE-DEFINED INTELLIGENCE

HPE believes Synergy will simplify systems management and application deployment more efficiently than traditional infrastructure by using software-defined intelligence. Historically, change operations required coordination across multiple teams, multiple tools, and complex interdependent processes often taking weeks to complete. HPE Synergy leverages HPE OneView as the unified management interface for all Synergy resources, allowing an IT administrator to discover, search, inventory, configure, provision, update, and diagnose in a fraction of the time compared to traditional siloed management approaches. HPE Synergy also uses one firmware / driver set for all resources, resulting in easier systems maintenance and the potential for less downtime. Since the underlying architecture is based on open standards, agencies can more easily deploy solutions such as Microsoft Azure Private Cloud that require minimal customization or dev work.

In addition, HPE Synergy leverages infrastructure templates for composability, which allows infrastructure to be deployed and updated quickly and consistently. The same

hardware—servers, storage, networking / fabric—can be configured and reconfigured via a library of templates facilitating an on-demand composability while ensuring infrastructure optimization for each application’s performance needs.

UNIFIED API

HPE recognizes the importance of the DevOps ecosystem environment and that agencies may use it to both lower the cost and increase the speed of application development. Subsequently, HPE Synergy and its composable infrastructure design are focused on aligning to these needs by integrating a unified, REST-based API. This open standards approach allows IT organizations to leverage management frameworks such as Microsoft Systems Center and VMWare vCenter, among others. HPE Synergy’s tight integration with leading management tools also facilitates IT automation of operational processes and workflow design that optimizes the use of existing tools and frameworks.

The unified API also supports open source automation and DevOps tools, such as Chef, Docker, OpenStack, Mesosphere, and Puppet to name a few. This support allows developers to use same tools as they use for the public cloud to build, test, and deploy applications. In addition, the unified API aggregates physical resources in the same way as virtual and public cloud resources, so developers can code without needing a detailed understanding of the underlying physical elements. Subsequently, HPE claims that developers will be able to provision new boot images in a matter of seconds using the HPE Synergy Image Streamer appliance.

BENEFITS OF EVOLVING BLADE & RACK ENVIRONMENTS TO HPE SYNERGY

HPE claims several powerful efficiencies that customers can take advantage of in transitioning from any blade and rack environment including the HPE BladeSystem c-Class portfolio to HPE Synergy.

- Single infrastructure that can run both traditional applications and cloud-native workloads quickly and efficiently
- Deployments use advanced software-defined intelligence and have the potential to reduce overall operational complexity
- Realization of superior cloud-like economics that can deliver a lower total cost of ownership (TCO) through improved resource utilization
- Design for the future: composable infrastructure is a modern architecture designed for delivering value now and in the future

HPE Synergy provides additional advantages around occupying the same datacenter footprint, backward compatibility around application support, and a shared management environment through HPE OneView. Released nearly three years ago and with over 600,000 licenses sold to date, HPE OneView has an impressively large installed base. MI&S believes these elements have the potential to support a smooth migration for current HPE BladeSystem customers to an HPE Synergy implementation. HPE's technical whitepaper [*The Benefits of Evolving Your HPE BladeSystem Environment to HPE Synergy*](#) provides more technical details and benchmarks.

HPE SYNERGY IMPLEMENTATIONS & CASE STUDIES

HPE has demonstrated a leadership position in deploying the composable infrastructure architecture through HPE Synergy public sector installations around the globe. Two implementations that warrant further consideration are EMIS Health Group and one US state's Department of Transportation.

BETTER PATIENT CARE THROUGH IT EFFICIENCY

EMIS Health Group, in Leeds, UK, supplies electronic patient record systems and software used in primary care in more than half of GP practices across the United Kingdom. Over the past 30 years, the company has transformed itself into a full-service provider to the healthcare industry. Its portfolio of offerings range from EMR (electronic medical recording) solutions, electronic prescription services, HIT (healthcare IT) infrastructure, engineering, and support services.

Improving patient care and delivering innovation to patients is at the forefront of EMIS Health Group's mission. According to its IT staff, HPE Synergy has enabled the healthcare solution provider to deliver new services and functionality rapidly. From an IT infrastructure build-out standpoint, what once required human intervention is now an automated process. Subsequently, staff is now able to focus on solving problems, improving services and enhancing point of care.

Furthermore, the organization reports dramatically improved flexibility with the implementation of a DevOps approach that facilitates a rapid scale out of infrastructure and deployment of new services. This has translated into putting cutting edge functionality and relevant healthcare information in the hands of patients. David Gee, Technical Solutions Manager comments, "The segregation of dev and test environments of the past has started to disappear with the feature set that the (HPE) Synergy Frame gives us." [*EMIS Health Group's video testimonial*](#) helps contextualize these DevOps benefits.

BETTER TRANSPORTATION MANAGEMENT VIA BOOSTING BANDWIDTH OF IT RESOURCES

This US state agency constructs, maintains, and regulates the use of transportation infrastructure including rail lines, highways, and airports. In serving the needs of its various departments, this agency was hard-pressed to keep up with the growing compute demands of the transportation infrastructure within its charter. Network connections, shared by a wide number of servers, resulted in limited capabilities, issues with the server infrastructure, and downtime. System reliability to support road traffic operations was critical, and the agency found it needed to replace older equipment to achieve a lower cost footprint of IT compute resources.

Subsequently, the agency was compelled to modernize and eliminate single points of failure. HPE Synergy was deployed to meet the demands, assuring readiness of resources at any time to support transportation processes. Pre-integration enabled smooth operational deployment, and installation time was shortened dramatically given the fluidity of the solution. The agency reported higher performance as well as increased bandwidth of IT resources of up to 400% compared to its previous network.

CALL TO ACTION

MI&S believes the market for composable infrastructure is still new with a range of vendor solutions and approaches emerging. Public sector datacenters will likely prioritize applications that could benefit from a self-service, flexible approach to application provisioning as the first to move to composable infrastructure, including a mix of both traditional and new applications in their deployment plans.

As IT organizations become familiar with composable infrastructure over the next few years, market demand will likely increase to include a wider range of workloads and use cases. IT organizations running next-generation applications with dynamic resource needs that are core to their charter (big data, software-defined storage, cloud-based services) should consider evaluating composable infrastructure solutions as a potential fit for their environments. In addition, traditional workloads (collaboration, data processing and analytics, supply chain, web infrastructure) could benefit from composable infrastructure via improved costs due to smarter allocation of resources and unified management.

In the near term, MI&S recommends that IT organizations begin evaluating vendor product roadmaps and consider proof-of-concept deployments for target applications. Over the next 12 to 18 months, the market is expected to dramatically ramp with

additional new products, tighter integrations across vendors, and usability enhancements to make deploying and managing composable infrastructure easier for mainstream IT organizations to adopt more widely.

HPE has a broad datacenter infrastructure portfolio, with HPE Synergy emerging as the first big bet in the company's composable infrastructure strategy. HPE has world-class Pointnext services and support organizations to help enterprise IT customers make the transition to composable infrastructure, and HPE has a long-term investment strategy to bring composable capabilities to more products in its portfolio over time. In addition, HPE says that Synergy will support the use of third-party storage and networking / fabric platforms, and MI&S expects HPE will continue to develop tighter integration with third-party platforms. HPE also plans to take composability to more sophisticated levels in the future. IT organizations looking to evaluate composable infrastructure for their environments should add HPE to their short list of vendors for consideration.

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