

# HudsonAlpha Adopts HPE Synergy to Accelerate Genomics Research

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## Executive Summary

Composable infrastructure enables IT to create flexible pools of infrastructure resources that can be allocated based on workload needs to automate operational changes at scale. Composable infrastructure is a new solution category still in the early stages of adoption. Hewlett Packard Enterprise (HPE) released the HPE Synergy platform in December 2015 as the first platform in the market built from the ground up for composability. HudsonAlpha is a nonprofit genetics and genomics institute that also houses—and provides IT resources for—over 30 life science companies. HudsonAlpha was an early adopter of the Synergy platform and is currently in the beta stage of adoption. This case study describes HudsonAlpha’s business and technical needs that led to their choice of the Synergy platform and their progress to date on deployment.

## Composable Infrastructure Market Opportunity

IT is undergoing a significant transformation, as businesses streamline costs and roll out new cloud-based applications driven by a changing digital economy. As one approach to address these changing IT demands, vendors are introducing solutions under a new category called “**composable infrastructure**”. Composable infrastructure is designed to treat hardware like software by deploying “infrastructure as code”, which allows IT to allocate the optimal set of resources (compute, storage, networking) for each application. Vendors promoting composable infrastructure solutions claim this approach will help IT lower total infrastructure costs, provide flexibility as resource needs change, and accelerate time-to-market for customer-facing applications.

HPE has invested significantly in composable infrastructure with a multi-phased plan to enable the ecosystem and its customers to transition to composable infrastructure solutions. HPE launched HPE Synergy December 2015 as the first platform in the market that is purpose-built for composability. Synergy is currently in beta with multiple customers. As a follow up to our [paper on Synergy](#) earlier this year, Moor Insights & Strategy had the opportunity to interview the first HPE Synergy beta customer, HudsonAlpha, to understand how it expects Synergy to help it keep pace with the demands of genomics research and its multiple tenant companies.

## HudsonAlpha Requires Datacenter Modernization to Increase Agility

HudsonAlpha is a nonprofit research institute with a substantial educational program and a genomic medicine clinic in Huntsville, Alabama. It built one of the world’s first end-to-end genomic medicine programs to diagnose rare disease. Nearly 20 faculty investigators conduct genomic research in multiple disease areas including cancer, childhood genetic disorders, neurological and physical disorders, and immunogenomics.

Genomics research continues to evolve as larger datasets become available. HudsonAlpha is a data-intensive organization that generates more than one petabyte of data a month and has the challenge of ensuring the data is quickly available to query for multiple purposes. In addition, HudsonAlpha requires powerful compute infrastructure to meet the demands of its in-house developed genomics algorithms and applications. HudsonAlpha is growing rapidly, with 100+ data scientists and engineers requiring access to compute, networking, and storage resources to accelerate their research. To keep up with the increasing demands of users and manage the growing amounts of data, HudsonAlpha needs to modernize its IT infrastructure.

## Why HPE Synergy is the Right Solution for HudsonAlpha

HudsonAlpha chose the HPE Synergy platform to make better use of its data and to increase DNA sequencing and compute capacity required by its tenant businesses. HudsonAlpha IT leaders highlighted a number of reasons why they selected the HPE Synergy platform for their next generation infrastructure refresh.

- **Pools of Resources:** HudsonAlpha already manages its infrastructure as pools of resources that can be allocated based on application needs to the different users in its multi-tenant environment. The HPE Synergy approach to resource pools aligns well with this resource allocation and management strategy.
- **Benefits of Direct Attach Storage:** HudsonAlpha's data-intensive workloads mean IT must optimize for an efficient storage strategy. The ability to use direct attach storage (DAS) with Synergy provided HudsonAlpha with a simpler architecture compared to traditional storage architectures.
- **HPE & Docker:** HudsonAlpha sees Docker containers as an important element for stateless delivery of microservices. HPE's efforts on bare metal orchestration with Docker Swarm and Docker Machine plus HPE's long-term commitment to Docker optimizations both align with HudsonAlpha's planned use of Docker.
- **Need for Agility:** HudsonAlpha scientists conduct research in collaboration with thousands of researchers worldwide. While common (shared) environments can be established, many of the workloads are so user-specific that a fresh environment is best. HudsonAlpha sees Synergy's capacity to get users up-and-running quickly with new applications as a potential benefit.

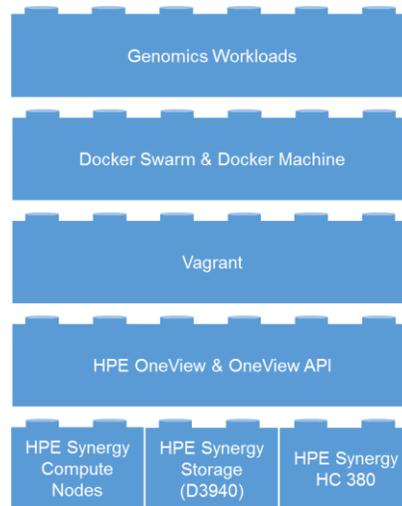
## Status of HudsonAlpha's HPE Synergy Deployment

HudsonAlpha is in beta mode with its deployment but has started to run production-level workloads on its new infrastructure, which includes one HPE Synergy Frame with three Synergy Compute Modules, a D3940 Storage Module, and three HPE Hyper Converged 380 systems using HPE OneView for systems management. To test ease-of-installation, HudsonAlpha set up the Synergy hardware in advance of the HPE support team's arrival and was able to complete the install process in-house.

HudsonAlpha is using Docker Swarm and Docker Machine on top of Synergy along with DevOps tools like Vagrant, a bare metal service discovery application for Docker that is

built on top of the OneView API. Figure 1 provides a high level overview of the beta environment used by HudsonAlpha. The Docker containers and genome workload scheduler in HudsonAlpha’s environment can access the Synergy nodes today. HudsonAlpha currently operates a considerable OpenStack environment and intends to make that one of the options for what can run on top of Synergy nodes in the future.

**Figure 1: HudsonAlpha Beta Environment with HPE Synergy**



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HudsonAlpha IT has already built its own templates for Synergy to help facilitate better transitions through tenants. HudsonAlpha developers have started deploying their own workloads to the Synergy hardware without requiring the help of operations. HudsonAlpha expects Synergy’s composable infrastructure capabilities to provide a bare metal cloud that allows quick access to specific resources and provides good visibility into how these resources are performing. In addition, HudsonAlpha is seeing a rich set of metrics at the applications layer. As HudsonAlpha looks to replace some of its existing infrastructure with Synergy, the IT team will measure the efficiency gains and orchestration capability improvements with Synergy compared legacy hardware.

## Conclusion

HudsonAlpha is growing quickly in terms of number of users in its multi-tenant environment and the amount of data that is managed, stored, and accessed by its users. This organization has a need to increase agility in the way it serves its users and how it manages large data sets. HudsonAlpha is a good example of how an innovative, early adopter customer with a cloud-native environment can take advantage of the benefits of HPE Synergy. HudsonAlpha believes over the long term it will be able to increase business agility with Synergy through capabilities like pools of resources, efficient storage architectures, and Docker optimizations, among others. As Synergy ramps into production later this year, HPE should continue to provide customer perspectives that demonstrate specific ways that Synergy can be beneficial for both cloud-native and traditional application use cases.

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