

Defense Agency Dramatically Shrinks Data Center Footprint

For several decades, a defense agency has worked to deliver the most efficient IT infrastructure possible to tenants within a highly classified environment. Over time, however, the agency's storage infrastructure fell behind industry improvements in storage technologies, such as virtualization. In addition, the storage environment was siloed due to the piecemeal nature of procurements performed to support the defense agency's tenants. Trapped capacity throughout the storage estate made volume management difficult, as well as capacity and performance analysis.

Around 2015, the defense agency's officials hit upon the solution: a storage virtualization layer to improve storage management. Storage virtualization wouldn't just improve data management – it also streamlined technology refreshes in the environment. These refreshes were generally performed on each array every five years. Each refresh required about 2.5 years of effort to fully migrate onto the new array, while the older array was maintained at an increased maintenance cost. This extended migration reduced the financial benefits of new storage arrays and required storage teams to continually manage migrations within the environment. With a storage virtualization solution, future technology refreshes could be performed non-disruptively, with no system downtime because the migration from old to new arrays is handled via the storage virtualization layer.

Storage virtualization would also deliver additional technical and financial benefits. Because all advanced functionality, such as snapshots and remote replication, is performed at the virtualization layer, legacy array

functionality improves. In addition, the ability to remove optional software, such as remote/local replication, can reduce software licensing costs by hundreds of thousands of dollars in an enterprise environment.

2015: Storage Virtualization Delivers on Its Promise

Recognizing the vast benefits of storage virtualization, the agency in 2015 deployed the Hitachi Virtual Storage Platform (VSP) G1000 to provide the storage virtualization layer for its entire storage environment. The Hitachi VSP G1000 was deployed as a diskless solution, providing only storage virtualization functionality for the defense agency storage environment. After its initial deployment, future technology refreshes became dramatically shorter – virtualization shrunk the typical migration time for storage arrays from two to three years to about two to three months.

Virtualization also brought the primary benefit that the defense agency was seeking from the project: a single point of data management. The Hitachi storage virtualization solution meant that stranded storage capacity became a thing of the past. Improved capacity utilization enabled the agency to reduce new storage procurements. In addition, the agency was now able to dynamically move data workloads around, without customer impact. Data could be migrated between arrays as a background process, without any application impact or reconfiguration. This benefited the defense agency by allowing continued optimization of the storage environment.

2020: The Defense Agency Modernizes for Improved Resiliency and Performance

By 2020, the defense agency's mission-critical data workloads – which include some of the Federal government's most sensitive, highly classified data – required greater resiliency, agility, and performance. To help address these needs, the defense agency engaged with Hitachi Vantara Federal to modernize and replace its core storage infrastructure, including the virtualization engine.

Like the dramatically improved technology refresh timeline that storage virtualization had previously provided, the Hitachi VSP offers the unique ability to non-disruptively migrate between generations of technology. Without reboots and tenant-impacting downtime, this migration again proved Hitachi's position as a storage leader. The storage infrastructure refresh reduced the historical refresh implementation period by 75 percent, shrunk the defense agency's data center by 25 percent, and delivered major benefits in cost, resiliency, and performance.

To consolidate data and improve storage and efficiency, the Hitachi VSP 5000 series was selected. It provides up to 99.999999 percent (8 nines) availability with a benchmark performance of 33 million input/output operations per second. It offers between 2 and 6 terabytes of cache, up to 192 front-end ports, up to 12 redundant storage controllers in a scale-out Peripheral Component Interconnect Express fabric, and up to 69 petabytes (PB) of all-flash or up to 287 PB of virtualized storage per array.

Deploying Hitachi VSP technology and related solutions such as Hitachi NAS 4000 series file gateways, the defense agency and Hitachi Vantara Federal embarked on a project that included the following:

- Design, planning, and implementation of 21 PB of all-flash block storage
- Non-disruptive migration of all data from existing block and network-attached storage to the target Hitachi solution

- Design, planning, and implementation of enterprise infrastructure management products to manage, monitor, and analyze the solution
- Ongoing management of the solution, as well as knowledge transfer and training

The Results: More Agility, Lower Costs

The 2020 storage refresh again showed clear results, consolidating more than 30 data center racks of equipment with only 12 racks of infrastructure. That's equivalent to shrinking a basketball court full of racks, storage, and other equipment down to a 10-by-10-foot space.

The solution provides enterprise storage data services for open system and mainframe block, file services, and object storage archival with synchronous and asynchronous replication between four different sites and four different security enclaves.

Bottom line: The defense agency's data center footprint shrank 25 percent, without any system downtime or impact to end users. Warfighters' missions continued, undisrupted.

The new storage technology supports executive branch goals of reducing greenhouse gas emissions and increasing the sustainability of Federal supply chains, including the green energy and sustainable purchasing goals laid out in DoD's 2022 [Sustainability Plan](#). This is due to the decreased need for power, cooling, and floor space. Hitachi Vantara data storage systems reduce power consumption by 30 to 40 percent, for example.

The initiative brought major benefits to the defense agency and American taxpayers alike, reducing the operational costs of running the data center and heightening resiliency, performance, and reliability. It is the government successfully doing more with less.

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