

# DHDW Consulting LLC

## PROFILE



### Industry

Federal Government

### Corporate Headquarters

Alexandria, VA

## IN BRIEF

### Key Challenges

- Emergency Management organization lacked centralized application procurement and provisioning process
- Existing legacy desktops lacked proper support, configuration management and compliance
- Mission-critical user community – stringent Concept of Operations, fault tolerance a key attribute of solution

### Solution

The end solution required design and implementation of an enterprise CAC-enabled Active Directory, redundant vSphere 5.0, View 4.5 VDI with Liquidware Labs Profile Unity. Virtual layer is hosted on a three-node Dell R710 cluster and remotely replicated NetApp FAS 3240 storage. Each site is load balanced with F5 Global Traffic Managers.

### Business Benefits

- Replaced unmanaged legacy desktops and applications with centralized, remotely managed virtual desktop infrastructure
- Applications are now centrally procured and managed providing equitable distribution throughout the organization
- DIACAP compliance and DR/COOP are inherent attributes of the solution

## DHDW Designs Always-on Virtual Desktop Solution for U.S. Department of Defense

In early 2009, DHDW Consulting was solicited to design and implement a virtual infrastructure that would address the following urgent and immediate challenges for an agency within the U.S. Department of Defense (DOD):

- Replace emergency operations center desktops that were globally dispersed and void of management, centralized authentication and configuration management.
- Enable efficient, centralized provisioning of an enterprise suite of applications across all associated user communities.
- Provide a new infrastructure that a small handful of support technicians can manage.
- Bolster the existing underlying transport infrastructure with high availability and standardized network services components.
- Meet or exceed existing security accreditation and compliance requirements in a rigorous DOD environment.
- Ensure that the overarching WAN-dependent solution is highly available and load-balanced for globally dispersed user communities; provide local and remote backup and disaster recovery.

The global Multiprotocol Label Switching (MPLS) network targeted for providing transport for the solution was also in a state of flux: major growth and frequent design modifications were the norm. Any proposed solution would have to endure this volatile environment during implementation and provide a stable foundation for services in production.

DHDW's initial design efforts focused on shoring up the various services that an end solution would rely on, along with a full design and implementation of Microsoft Active Directory complete with Public Key Infrastructure-Common Access Card (PKI-CAC) secure authentication.

The end solution would have to serve two purposes: fully complement and bolster existing transport services while providing resilient enterprise services for a broad spectrum of globally dispersed mission-critical user communities.

### Choosing the Right Components for a New Foundation

After fully defining customer requirements, DHDW began its design efforts with a very specific end state in mind. Although DHDW considered several competing technologies, ultimately the team decided on the following key components for the solution:

- VMware vSphere® was used for the underlying virtual infrastructure, and VMware® View™ for the virtual desktop infrastructure (VDI). These products provide a turnkey solution (hypervisor, VDI, etc.) and a single source for proven world-class support for the entire solution stack.
- NetApp was the obvious storage solution of choice because of its inherent out-of-the-box integration with VMware. It also affords flexibility for customized code and scripting, which was necessary for creating the site replication topology that the solution required.

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*“Cost containment, agile service delivery and high availability are now a reality for this mission-critical organization.”*

Don Wiggins  
President,  
DHDW Consulting LLC

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- For the first iteration, DHDW decided on Dell’s PowerEdge R710 servers. Optimized for virtualization with exceptional CPU and memory density in a minimal form factor, these servers offered a price point that accommodated the minimal initial budget.
- Intercomponent connectivity was provided through Fibre Channel Brocade switch fabric, and DHDW chose F5 BIG-IP Global Traffic Manager (GTM) load balancers for their proven reliability and scalability with services distribution.

Although DHDW’s methodology can be transferred and repeated from one engagement to the next, the company realizes that no two solutions can meet identical sets of requirements. Sizing and service levels typically vary from one customer to the next. For larger, more I/O-intensive implementations, DHDW typically employs Cisco’s Unified Computing System (UCS), combining best-in-class subsystem components for high performance, scalability and reliability; Cisco Nexus switching; Cisco Blade Servers; and NetApp storage.

## Getting from Here to There

After properly sizing the engagement and deciding on the key components of the solution, DHDW turned its focus to engineering an environment conducive to global distribution of rapidly deployable services to both internal and external customers.

DHDW discovered early on that key underlying services were hosted on disparate, legacy platforms that had continually caused problems with compliance and configuration management. This mix of aging flavors of UNIX, Solaris, and Mac OS X coupled with end-of-life hardware made it difficult for the existing support team to meet and maintain the mandated DOD Information Assurance Certification and Compliance (DIACAP) accreditation required of all DOD information systems. Before the new virtual infrastructure was implemented, optimization of the underlying transport infrastructure was sorely needed.

To address this requirement, the DHDW design team built a new, fully redundant VMware based virtual infrastructure at previously underutilized datacenters on each coast of the United States. The team then began the migration of various network services from antiquated legacy infrastructure to a standardized and completely supported VMware, Windows, Linux and NetApp-based environment—significantly easing management, compliance and agile service delivery. DHDW engineers worked closely with existing network engineering and information assurance staff during the transition to maintain full operations and DIACAP compliance.

## An Enterprise Infrastructure for Everyone

Now that the agency was no longer constrained by complex, cost-prohibitive silos of infrastructure, its new enterprise approach to service delivery began to bring newfound efficiencies and capabilities.

The agency’s disparate programs previously lacked key infrastructure components to enable standardization, so compliance with single organizational governance had been difficult. In the new enterprise environment, these programs could now “subscribe” to extensible services such as centrally managed CAC-enabled Active Directory. This unified the programs’ access control while enabling them to delegate ownership and responsibility of each program’s assets. Some program staff had been concerned the technological changes would threaten their long-term viability, but participants quickly realized that staff would instead feel empowered by the new approach.”

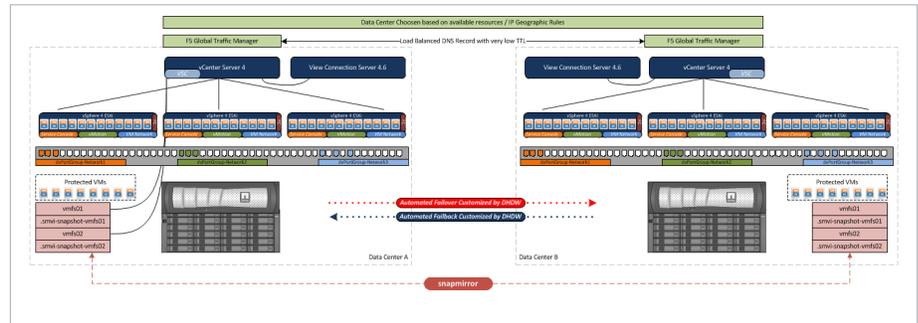
Newly integrated entities folded their individual application suites into a VMware ThinApp® environment with exceptional ease; cost-effective concurrent licensing and broader access to new products for all user communities became the norm. For example, the globally dispersed emergency management community was now able to outsource application hosting to an enterprise virtual desktop provider. This approach eliminated local desktop support requirements while introducing rapid deployment of application services to users with the five-minute installation of a stateless zero client.

IT budgets also became far more manageable. The new environment facilitated centralized procurements, annual support renewals, and overall strategic and tactical budgetary planning. Individual programs could place more emphasis on funding development efforts while leveraging a suite of standardized enterprise services with inherent compliance, disaster recovery (DR) and continuity of operations (COOP).

### Practical Innovation

The fully vetted and DIACAP-accredited end solution provided

- Global CAC-enabled Active Directory to manage people, assets and policy
- Demystified, standardized hardware and software
- Decoupling of applications from proprietary platforms
- Rapidly deployable services from a single leveraged platform:
  - Centrally managed virtual desktops and applications
  - Zero maintenance end-user interfaces (zero clients, iPad, smartphones)
  - Virtually hosted business applications
- Inherent high availability, load balancing and DR/COOP of the entire service stack



IMPLEMENTATION OVERVIEW		
<p><b>VMware Footprint:</b>                      VMware vSphere 5.0                      VMware View 4.5</p>	<p><b>Applications Virtualized:</b>                      MS Office Suite                      Marplot/Cameo/ALOHA                      Hurrevac</p> <p><b>Partner:</b>                      VMware design, implementation and support by DHDW Consulting                      Network design, implementation and support by Gupton &amp; Associates</p>	<p><b>Platform:</b>                      Storage is exclusively NetApp (FAS3240)                      Servers are exclusively Dell Power Edge R710                      Network components are exclusively Juniper (routing/switching/firewall)                      Load Balancing – F5 Global Traffic Managers                      Fiber Channel Switch Fabric – Brocade</p>

