

## Hawaii Medical Service Association



### CHALLENGES

As part of a major corporate initiative to improve the efficiency and effectiveness of their technology stacks, HMSA began to evaluate their desktop environment in 2012. HIPAA's data loss prevention (DLP) compliance requirements were becoming increasingly difficult to meet with physical desktops, and it was clear that a Windows 7 migration would be a near-term future project. Two physical desktop refreshes, one in 2003 and the last in 2009, were each 18 month projects that consumed considerable IT resources, leaving Stuart Shirai, the Manager of Network and Telecom Information Systems at HMSA, with a strong desire to get away from managing physical PCs. In 2009, the resulting cost per desktop was a whopping \$1397.

Shirai and his team began to look at virtual desktop infrastructure (VDI) technology. VDI promised to deliver Windows desktops to a variety of different end point device types—in particular Apple MacBooks—yet allow them to be managed centrally in the data center. This centralization would also make it much easier to address HIPAA's security requirements, and would simplify administrative operations like OS migrations and desktop refreshes.

A VDI deployment also offered options to meet two other requirements HMSA had in mind: making the move to VDI without having to change users' existing Windows desktop images, and providing a way to recover desktops quickly and reliably in the event of host failures. If possible, HMSA hoped to initially implement persistent virtual desktops with their existing Windows XP images, with a later move to Windows 7 and then ultimately to stateless desktops.

But Shirai knew there would be challenges. A number of his colleagues at other companies had been down the VDI path, and he knew that delivering the right user experience would be critical, but that it may be very difficult to do that while providing a cost per desktop below that of physical PCs. Desktop virtualization is very different than server virtualization, with extremely write-intensive desktop workloads that can spike to over 10x the steady-state desktop IOPS requirements during certain operations like boot, logon, and application launches.

HMSA had profiled their existing physical desktops and determined that, with their dedicated internal disk spindles, they were each capable of delivering 150 IOPS. Using traditional SAN or NAS storage to deliver that same 150 IOPS to virtual desktops, Shirai calculated that the shared storage cost alone would be roughly \$1755/desktop. Clearly, this would not be acceptable.

### SOLVING THE VDI STORAGE PROBLEM

The basic problem was that, with the desktop workload, each network disk spindle just delivered too few IOPS. In order to address the high IOPS requirements, HMSA experimented with flash memory storage from Fusion-io.



Originally established in 1938, Hawaii Medical Service Association (HMSA) is a non-profit organization that is the largest and most experienced provider of health care coverage in the state. Since 1995, HMSA has received numerous awards, including the Blue Cross Blue Shield Association's Brand Excellence Award, the National Committee for Quality Assurance's highest HMO accreditation, the Health Plan Disease Management Leadership Award from the Disease Management Association of America, and the C. Everett Koop National Health Award. With 1,700 employees and well over 600,000 members, HMSA has revenue of over \$2B and serves over half the population of the nation's 50th state.

**“It became clear early on that we could not cost-effectively meet our objective of providing virtual desktop performance on par with that of physical PCs with conventional network storage technologies.”**

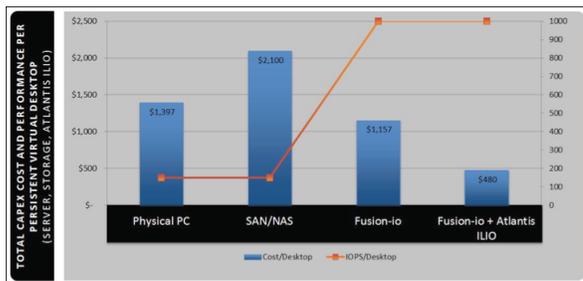
Stuart Shirai  
Manager of Network and  
Telecom Information Systems,  
HMSA

The Fusion-io ioDrive cards, each supporting 1.2TB of physical storage, clearly addressed the desktop performance problem, delivering a user experience that noticeably outperformed physical PCs. But with each Windows 7 desktop requiring 40GB of physical storage capacity, each ioDrive card would only be able to host 30 desktops. The ioDrive cards did, however, reduce the amount of physical disk spindles required in the shared storage, dropping the cost per desktop (including a 1.2TB ioDrive card in each host) to \$1157.

While researching options online, Shirai came across Atlantis Computing. The Atlantis In-Memory Storage technology was fully compatible with Fusion-io's product line, promising to increase the desktop density each ioDrive card could support by over 600% while maintaining Fusion-io's blazing desktop performance. With this type of density increase, the combined configuration promised to drop the cost per desktop to below \$500.

### ATLANTIS ILIO AND IN-MEMORY STORAGE TECHNOLOGY

Atlantis ILIO is a 100% software solution that deploys in a dedicated VM in each host, using a variety of storage optimization technologies to minimize desktop IO and reduce the runtime desktop storage footprint by up to 95%. All desktop IO is processed and minimized in the Atlantis VM before it is written to primary storage, which in this case are the ioDrive cards. Atlantis ILIO reduced the 40GB desktop footprints to less than 4GB each without impacting data integrity or performance, allowing each 1.2TB ioDrive card to host up to 300 desktops. The cost per desktop with the revised configuration was \$480. HMSA implemented using the persistent desktop model based on VMware vSphere and VMware Horizon View but can move to a non-persistent model at any point in the future. Atlantis ILIO Fast Replication ensured that a deduplicated copy of each current desktop image was maintained on a very small amount of external shared storage to support high availability.



### HIGH PERFORMANCE, FLEXIBLE VDI AT THE RIGHT PRICE POINT

The combination of Atlantis ILIO and Fusion-io turned HMSA's VDI project into an extremely compelling one from an economic point of view. In their deployed configuration of 1700 persistent virtual desktops, HMSA reduced their cost per desktop from the \$1755 anticipated with a network storage configuration down to \$480, a 73% reduction while delivering just over 1000 IOPS per desktop (compared to the 150 IOPS that the physical PCs were delivering). Virtual desktops now boot in 7 seconds, and the Microsoft Office applications suite launches in under 1 second.

### BENEFITS

- Combined Atlantis/Fusion-io VDI storage solution dropped projected storage cost per persistent desktop by 73% while delivering almost 7 times the performance of physical desktops
- Joint solution delivered all the promised mobility, security, and administrative benefits that VDI offers at an economically compelling price point
- Simplified solution scales linearly and predictably, removing the risks from VDI rollouts as projects evolve

**“With Atlantis ILIO and Fusion-io, our boot times dropped from around 2 minutes [with physical PCs] to 7 seconds and our application launch times dropped to under 1 second”**

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