British Healthcare Agency Makes Virtual Desktops Faster than Physical Desktops

British healthcare agency virtualizes 5,500 desktops, wakes up from the "nightmare" of up to 20-minute logins

Solution Focus
- VMware Horizon View
- Healthcare

Summary of Benefits
- Enables high-performance desktops
- Supports more than 220 desktops per server
- Scales linearly and simply
- Slashes rack space and power costs

The Challenge

National Health Service (NHS) is the United Kingdom's publicly funded healthcare system that provides free medical services to residents of the UK. The NHS West and South Yorkshire and Bassetlaw Commissioning Support Unit (CSU) serves the 500,000 residents of those two towns.

Doctors are trading prescription pads and charts for electronic devices that store data in the cloud, and NHS West and South Yorkshire and Bassetlaw CSU needed to empower doctors and staff to serve patients more efficiently. However, with 5,500 doctors and staff across 110 sites, the IT department needed to find technology that was simple to deploy and manage without sacrificing performance, availability, or security.

Martin Powis, Head of IT, had been interested in virtual desktop infrastructure for years. "We brought the business case forward for virtual desktops as an alternative to physical desktop replacement," Martin said. The NHS Trust directors liked the idea of replacing aging desktop PCs with terminals, and using virtual desktop infrastructure to centralize management and harness the processing power of the computers in its data center.

But the first proof of concept, using a traditional virtual desktop infrastructure architecture based on disk drives, did not deliver. Windows couldn't update itself as frequently as it needed, so user sessions would freeze. Doctors and staff experienced lag between typing and words appearing on screen, and signing in to the system could take up to 20 minutes. The trust needed to find a system that would:
1. Reduce login times and provide a seamless user experience
2. Support hundreds of desktops per server
3. Scale easily and simply for future growth
4. Slash rack space and power consumption to reduce operating costs

"We were confident we could achieve our goals with virtual desktop infrastructure," Martin told us. "We just needed the right back-end architecture to support it."

The SanDisk® Solution

The Trust issued a tender and heard from a range of vendors. One solution the Trust considered was using blade servers with traditional disk storage. However, the Trust was concerned about the network connectivity and bandwidth required to support 5,500 users via hard disks. "The network capacity and latency would have been an issue," Martin said. To support 5,500 users, they would have needed a whole 42U rack of disks, which would have consumed too much power. On top of this, they would have to purchase all the network cables and controllers to support it.

One early trial using iSCSI storage with VMware Horizon View brought to light the "pinch points" where the system needed to improve. "One of the biggest things we found we needed was disk speed, IOPS, and low latency," Martin said.

The winning bid consisted of Fusion ioMemory™ ioDrive®2 products. "The SanDisk-based architecture is more distributed and has fewer points of failure," Martin told us. The Trust installed ioDrive2 1.2TB products into 22 servers, and easily brought 5,500 users into the virtual environment.

A Seamless User Experience

In many industries, virtual desktop infrastructure isn't viable because employees won't accept performance less than that of PCs. But employees in medical, educational, and financial industries are often required to suffer poorly-performing desktops for compliance regulations that essentially require centralization of data. The Fusion ioMemory products delivered performance that exceeded physical PCs.

Logins used to be "a complete nightmare," Martin said. It could take 20 minutes for a doctor or staff member to log in to a physical desktop over a wide area connection. After adding SanDisk products to the server, distributing the load, and virtualizing the desktops, it now takes less than a minute to log in. "We're now down to less than a minute for the majority of users," Martin said, "and the majority of that time is the boot up of their terminal."

Login Time

With SanDisk — 1 minute
Without SanDisk — 20 minutes

20X IMPROVEMENT

This had a side benefit—increased productivity. As users found they had more resources available to them, they in turn used more. Users are able to get more work done more efficiently. Martin found that the virtual desktops powered by Fusion ioMemory products were much faster than physical desktops. NHS uses large Java applications that used to max out the disk-based virtual desktop infrastructure system, but even though users are doing more now, the system doesn't lag the way it used to under the increased I/O load and the distributed architecture.

Another benefit: NHS West and South Yorkshire and Bassetlaw CSU's environment is easier to manage now, as Martin no longer has to visit the sites to support the desktop PCs.

Supports Hundreds of Desktops Per Server

The Trust's tender was for 220 users per server, but they were able to support more than 300 users per ioDrive product. At about 340 users, the server CPU finally maxed, Martin said. Using SanDisk products builds in high availability. If a server goes offline in the case of a failure or disaster, other servers have the resilience to support them. "We've got plenty of slack to accommodate any displaced users," he said.

SanDisk®
a Western Digital brand

Building Block Architecture Scales for Easy Growth

Another benefit of the SanDisk-based architecture is its scalability. "It's a very simple architecture that scales at low and predictable cost. We've been able to sit down and determine the exact cost to bring another 200 users online. When we need to do this, we can simply add another server with an ioDrive product and we've got another 200 users on our environment, literally in minutes."
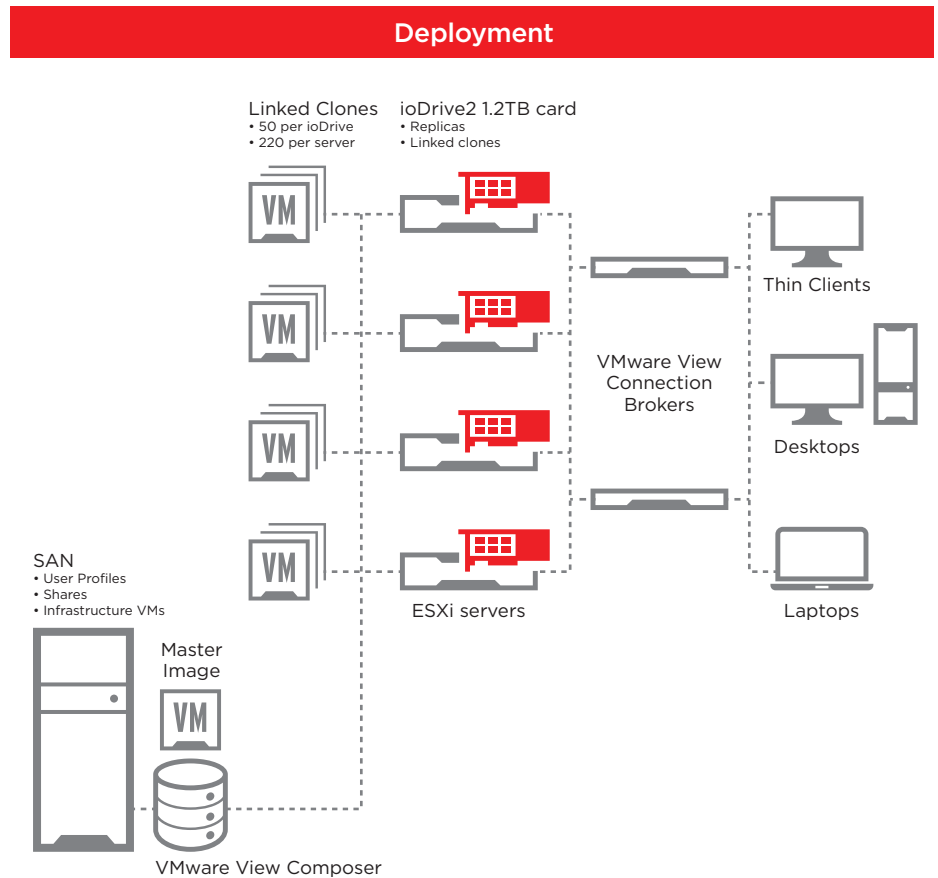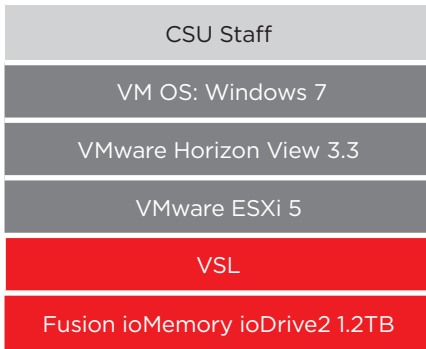
Reduces Operating Costs

The SanDisk-based system reduces costs on several fronts:

- Less hardware to maintain. The SanDisk-based solution eliminated reliance on 42U of hard disks.
- Less floor space—by an entire rack of disks.
- Less power and cooling. The SanDisk-based system eliminated 42U of disks to power and cool.

System Overview

SanDisk Powered Software Stack

CSU Staff
VM OS: Windows 7
VMware Horizon View 3.3
VMware ESXi 5
VSL
Fusion ioMemory ioDrive2 1.2TB

Deployment

Linked Clones
• 50 per ioDrive
• 220 per server

ioDrive2 1.2TB card
• Replicas
• Linked clones

VMware View Connection Brokers

Thin Clients

Desktops

Laptops

ESXi servers

SAN
• User Profiles
• Shares
• Infrastructure VMs

Master Image

VMware View Composer

System Overview

- 25x HP DL580 servers, each with 4 x 10-core processors, 512GB memory
- OS: VMware ESXi 5
- Application: VMware Horizon View 3.3
- Fusion ioMemory: 25 x ioDrive2 1.2TB card
- VMware vShield
- VMware Operations Manager
- 220 desktops per server

SanDisk®
a Western Digital brand
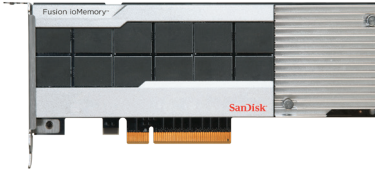
Fusion ioMemory™ - ioDrive®2

Summary

Using Fusion ioMemory products in their solution gave NHS the following benefits:

- Enables high-performance desktops
- Supports more than 220 desktops per server
- Linear, building block scaling
- Slashes rack space and power costs

Martin has another goal: By gaining expertise in virtualization, West and South Yorkshire and Bassetlaw CSU can offer services to other NHS districts. "In the next 12 months we'll be delivering 10,000 desktops. Our role will change from looking after not only the town, but the county," Martin said. "We plan to scale to 10,000 desktops in the next year and 20,000 in the year following – selling these services to the rest of NHS."

About NHS West and South Yorkshire and Bassetlaw CSU

NHS West and South Yorkshire and Bassetlaw CSU is responsible for all health services delivered to the local community of about 500,000, and manages 5,500 client devices for more than 600 NHS service areas with 20 different organizations at over 130 sites across West Yorkshire, U.K.

a Western Digital brand

At SanDisk, we're expanding the possibilities of data storage. For more than 25 years, SanDisk's ideas have helped transform the industry, delivering next generation storage solutions for consumers and businesses around the globe.