



# Clydebank College Makes IT for Further Education Smarter

State-of-the-art further IT education facility deploys SanDisk®-powered virtual desktops to reduce costs, improve Quality of Service (QoS) to desktops, and support hundreds of concurrent users per server.

## Solution Focus

- VMware View (virtual desktop infrastructure)
- VMware ESXi 4.1
- Education

## Summary of Benefits

- **Eliminate boot storms**
- **Improve performance** while reducing costs
- **Reduce SAN burden** to extend SAN investment
- **Serve one hundred concurrent users** from a single server
- **Increase IT productivity** through quick and easy deployment or upgrade of desktops

## The Challenge

When Clydebank College opened the doors to its new, purpose-built, state-of-the-art campus in August 2007, it heralded a new era for the college characterised by a firm commitment to and investment in helping learners realize their potential and achieve success.

Dubbed by its students as “the coolest college” and boasting state-of-the-art workshops, teaching areas, and facilities, it is easy to see why Clydebank College has become the first choice for learning new skills for more than 11,000 students each year, attracting high school graduates and returning adults.

Clydebank’s rapid growth presents a challenge for David Black, Head of ICT for Clydebank College. At any given time, there are over 1,000 students on the Clydebank College network. David and his team are responsible for keeping approximately 600 PCs up-to-date and function properly. Trying to keep these machines updated, as well as replacing obsolete machines about every four years, was becoming very costly.

“I was eager to deploy virtual desktop infrastructure to extend the life of these PCs and reduce costs,” David said. “I quickly learned however that providing the performance and QoS to the desktops, during boot storms and other peak utilization times, required adding far too many disks to my SAN to be cost effective.”

David needed a system that met the following requirements:

1. Delivered virtual desktop performance better than or equal to physical systems. Poorly performing desktops would not reflect well on the state-of-the-art appeal Clydebank wanted to establish to attract new students. It would also frustrate students and impact productivity.
2. Was immune to boot storms. Many classes begin at the same time with students and instructors all logging on at once. Teachers needed to begin instruction immediately and without waiting for slow student desktop launches.
3. Was cost effective. The primary impetus for a move to virtual desktop infrastructure is to cut costs. If the savings were negated by the expense of adding expensive storage to a legacy SAN then the solution wouldn’t work.

## The Solution

David and his team conferred with Taupo Consulting, who set them up with a SanDisk-powered proof of concept (POC) that immediately convinced David that the system would meet all requirements.

*“Traditional SAN is not the place for virtual desktop infrastructure. SanDisk’s Fusion ioMemory solutions are much better suited to deliver the performance necessary for virtual desktop infrastructure.”*

**David Black,**  
Head of ICT, Clydebank College

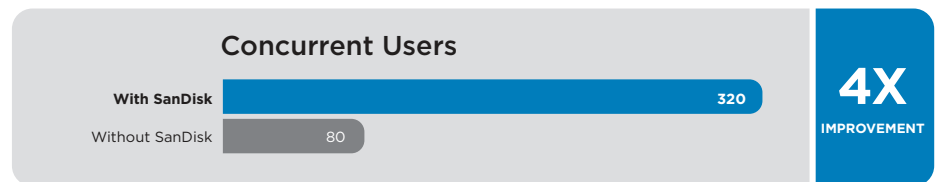
## Performance That Passes the Test

“Traditional SAN is not the place for virtual desktop infrastructure. SanDisk’s Fusion ioMemory™ solutions are much better suited to deliver the necessary performance,” said David.

The PCs managed by David and his team were running Windows XP. For the POC they wanted to test the speed at which they could upgrade and deploy a new operating system on these PCs, since this is the kind of task that would typically take the team several days to complete. With a Fusion ioMemory ioDrive® Duo card installed in the VMware View server, they deployed a golden image of the Windows 7 operating system. In a matter of minutes they were able to deploy the linked clones on 80 PCs and complete the upgrade. Pleased with these results, David now knows he will not have to purchase entirely new PCs as frequently and can update desktops with the latest software simply by updating the virtual desktop image. He can also depend on the ioDrive Duo cards to deliver the necessary performance. According to David, “We are now much more productive than with a physical PC. The ioDrive cards make each virtual PC performs as if it has its own local SSD.”

## Eliminating Boot Storms Makes the Grade

Clydebank runs virtual desktop infrastructure on four ESXi hosts (3 virtual desktop infrastructure active + 1 active stand-by) with up to 320 concurrent users. Prior to deploying the Fusion ioMemory solution, the SAN could only support about 80 concurrent users. Now, even with 320 users accessing the servers at the same time, desktops initiate as soon as users log on.



## Doing the Math Equals Cost Savings

With the POC proving the performance and scalability benefits, David next turned his attention to the cost analysis.

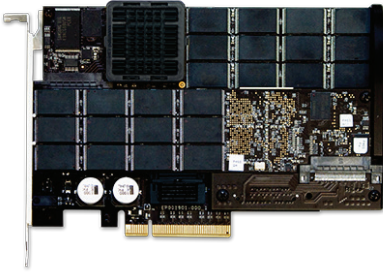
He found that a single server with an ioDrive Duo 640GB card could easily support 100 desktops for roughly half the cost of the additional SAN capacity required to support the same number of desktops. This was good news since the cost-saving potential of virtual desktop infrastructure was what drew David to investigate solutions in the first place.

“Without the ioDrive cards, any cost savings from deploying virtual desktop infrastructure would have immediately been negated by the cost of the additional SAN storage needed to deliver the same QoS,” David said. “Adding capacity to the SAN also would have required additional network infrastructure, and would have increased the complexity and power requirements of our system. The SanDisk solution just makes sense from all angles.”

## Preserving IT Investment and Enhancing Efficiency

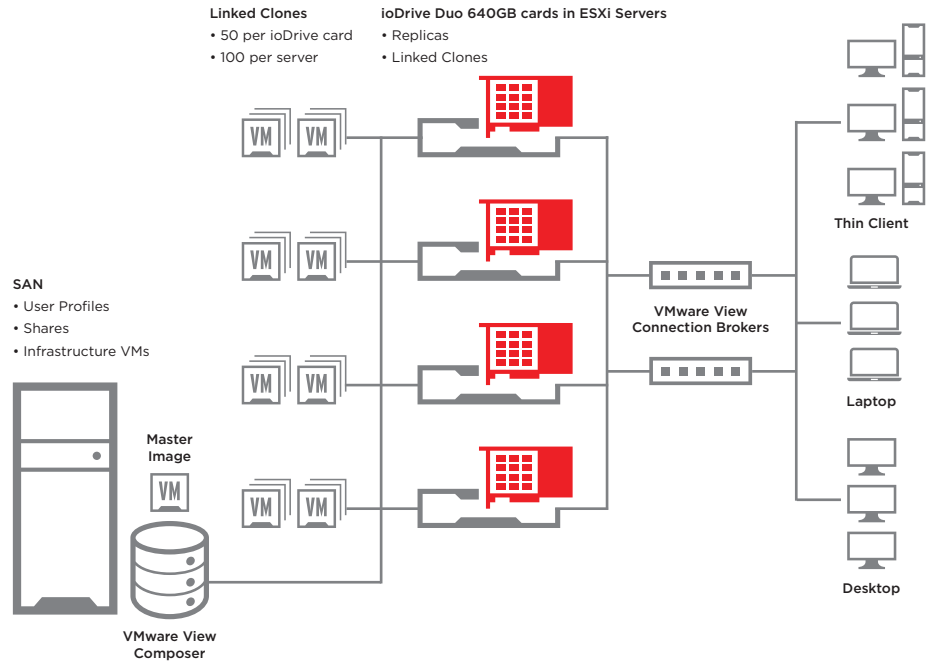
Because the desktops no longer have to rely on it for booting, the SAN runs more efficiently, and its resources can be used for capacity instead of performance.

David explained, “We deployed ioDrive cards specifically to support our virtualized desktops, but the benefits did not stop there. The improvements that have been realized throughout the entire virtual desktop infrastructure have turned into real cost savings for us. I know I can scale this environment without increasing costs and complexity. This is a huge relief for me.”



Fusion ioMemory™ - ioDrive® Duo

## Deployment



- 4 x HP DL380 G7 servers, 2 x 6-core CPUs, 128GB RAM
- OS: VMware ESXi 4.1, vSphere 4.1, and vCenter 4.1
- Applications: VMware View 4.6
- 4 x ioDrive Duo 640GB cards

### Contact information

sales-hp@sandisk.com

#### Western Digital Technologies, Inc.

951 SanDisk Drive  
Milpitas, CA 95035-7933, USA  
T: 1-800-578-6007

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#### SanDisk Europe, Middle East, Africa

Unit 100, Airside Business Park  
Swords, County Dublin, Ireland  
T: 1-800-578-6007

#### SanDisk Asia Pacific

Suite C, D, E, 23/F, No. 918 Middle  
Huahai Road, Jiu Shi Renaissance Building  
Shanghai, 20031, P.R. China  
T: 1-800-578-6007

For more information, please visit:

[www.sandisk.com/hp](http://www.sandisk.com/hp)

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### Summary

With the SanDisk Fusion ioMemory solution, David and his team are able to deliver desktop services consistent with their new, state-of-the-art higher-education facility and provide these benefits:

- **Eliminate boot storms**
- **Improve performance** while reducing costs
- **Reduce SAN burden** to extend SAN investment
- **Serve one hundred concurrent users** from a single server
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### About Clydebank College

Clydebank College is part of the regeneration of West Dunbartonshire with a 6-acre campus on the banks of the River Clyde. It provides students with a state-of-the-art learning environment.

With more than 11,000 learners each year from over 55 nationalities, the College attracts both high school graduates and returning adults to its full-time, part-time, and lifestyle programs. Some students choose to gain a qualification such as an HNC or HND and immediately enter employment, while others choose to follow a program that will lead to further study. Many attend to upgrade their workplace skills, and others enroll to pursue a dream they have contemplated for years.

The performance results discussed herein are based on internal Clydebank College testing and use of Fusion ioMemory products. Results and performance may vary according to configurations and systems, including drive capacity, system architecture and applications.

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