

VKernel Case Study: University of Nottingham



The University of
Nottingham

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Industry

Higher Education and Research

Challenge

To utilize resources more efficiently and cost-effectively by consolidating and virtualizing all servers throughout the campus

Solution

VKernel vOperations Suite

Results

- Improved performance, in some cases resulting in better performance than with dedicated servers,
- Successfully grew the number of virtual servers in the data center by 300% as part of the physical-to-virtual (P2V) initiative
- Achieved significant savings by increasing the number of VMs per physical server and reducing storage space through identifying data waste (up to 200 GB in a single month alone)
- Now able to plan for capacity more accurately and effectively, and to allocate actual IT expenses to the individual departments

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– Craig Place, *Systems Developer*, The University of Nottingham

University of Nottingham

The University of Nottingham is ranked within the top one percent of all universities worldwide with its placement at 73RD in the QS World University Rankings. As a major research institution delivering work of international significance, the university also ranked seventh in the UK by the Research Assessment Exercise in 2008. Nottingham has campuses in the UK, Malaysia and China, with a staff of nearly 8,000 and over 40,000 undergraduate and postgraduate students.

The Need: Maintaining Application Performance Through the P2V Migration

To save money and reduce the university’s carbon footprint, Nottingham decided to consolidate and virtualize all servers into the data centers on its UK campus. The effort involved relocating servers that were currently installed throughout the various departments. Each department’s IT administrator understood the business need for consolidation, but many were quite concerned about the effect virtualization might have on performance. As a result, some application owners made unreasonable resource allocation requests during the physical-to-virtual (P2V) migration, such as asking for 16 GB of memory for applications that needed only a fraction of that resource, to ensure good performance. Importantly, over-allocating computing resources would undermine the university’s goal to reduce costs, which was the primary driver for the virtualization initiative.

Craig Place, Systems Developer at the university, knew he would need some sophisticated management capabilities to ensure a smooth migration, and chose VKernel’s vOperations Suite based on its industry-leading feature set. According to Place, “After attending a conference on virtualization, I learnt that VKernel was way ahead of all others offering management software. So it became the obvious choice for our needs.”

Optimizing Resource Utilization

Place was able to get the vOperations Suite™ up and running within a day. After using vOPS to first obtain a complete inventory of the newly-consolidated environment, Place turned his attention to allocating the now-virtualized resources across the many different departmental applications. He used vOPS™ Capacity Manager to squeeze as many VMs as possible onto each physical server, without adversely impacting performance. By doing so, Nottingham has been able to postpone adding more ESX hosts to satisfy the growing demand. Because the data centers had also become quite crowded during the consolidation phase, the university was also able to avoid a forklift upgrade to space-saving blade servers.

In addition, vOPS™ helped Place reclaim a significant amount of costly storage capacity. “I don’t think that we would have been able to find as many files that had

been left on the environment to reclaim. In the last month alone, I've cleared off nearly 200 GB of storage. If we're looking at roughly 20 GB per VM, that equates to several additional VMs that we can add. This helps us squeeze that last VM on to an ESX host without impacting performance."

Rightsizing the VMs

According to Place, "We had a number of people who were requesting large VMs, despite our suggestion that they didn't need everything they were asking for." Place had learned that he could rely on the recommendations made by the vOPS™ Optimizer and found that the rightsized VMs were able to deliver better performance in some cases than with dedicated physical servers.

vOPS also helped Place justify changes if any users complained or disagreed with the reallocation of computing resources: "VKernel provides evidence which supports recommendations to application owners that resource settings need to be lowered, to reflect actual usage and reassure them that performance will not suffer."

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"Rightsizing VMs using the VKernel software has given us a considerable amount of maneuvering room, and that has spared the university from facing some very expensive alternatives for growing our total capacity," Place added.

Allocating (and Recovering) Costs

The consolidated and virtualized environment is now stable, enabling Place to monitor it on a periodic basis, mostly using email alerts, and to continuously optimize usage with the vOPS Optimizer's Wastefinder feature.

The next step for Nottingham will be to accurately allocate costs across all individual departments. The university is not employing a chargeback procedure yet, but Place is pleased that vOPS has this capability as they continue to explore how to handle the cost allocation: "If it weren't for the VKernel software, I don't think we could have worked out the cost per VM as easily."

Knowing the allocation of resources makes capacity planning much easier, as well. "We are now confident we currently have adequate hardware to meet our foreseeable needs, and we are also now able to forecast when we will need to increase server capacity," Place concluded.



Call (866) 370-2733 | www.vkernel.com



VKernel
300 Brickstone Square, Suite 503
Andover, MA 01810 USA
+1 (978) 289-6300 tel
+1 (978) 239-6301 fax

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