Simple scalability, agility and self-service automation help make Nutanix Enterprise Cloud the clear choice for demanding University of Reading academics

Nutanix Powered Academic Cloud Serves Up IT On-demand To University Researchers

University of Reading

CHALLENGE

While similar in many respects, the IT requirements of university research teams are often far removed from those of commercial workloads. In addition to vastly higher compute and storage demands, for example, research workloads can be a lot harder to predict and liable to change significantly at very short notice, as Ryan Kennedy, Academic Computing Team Manager at the University of Reading explains.

"IT has become a key research tool and it's not unusual for academics to request access to hundreds of VMs connected to terabytes of storage one day, only to dump them and start over the next," he said. "Delivering that kind of ad-hoc scalability using conventional servers and storage platforms is both complex and time consuming, especially for IT staff employed to support the research, not manage the infrastructure."

Against that background Kennedy and his team were finding it increasingly difficult to deliver the IT resources research users were demanding. Moreover, with virtualization a key part of the solution, licensing costs were becoming an issue and, while big projects could afford to finance new infrastructure, it was hard to justify spending to meet the needs of those with limited funds.

A simpler and more agile solution was clearly required and one which could be shared more equitably and automated to allow for greater hands-off management.

SOLUTION

Among several alternatives investigated the public cloud was an obvious candidate but not necessarily a good fit as Kennedy, again, outlines.

"While the public cloud could deliver the on-demand agility and self-service management we were after, the unpredictable workloads would make it more expensive and, potentially, harder and more time consuming for us to manage. There were also concerns about data protection and compliance, especially given the sensitive nature of the data involved and the need to protect intellectual copyright."

A brief and costly trial using Azure proved the validity of these concerns, at which point Kennedy persuaded the University to instead consolidate its existing infrastructure – then spread across multiple sites – into one on-premise data centre. Moreover, rather than simply upgrading the existing infrastructure, the decision was taken to switch to the Nutanix Enterprise Cloud OS software running on Dell EMC XC series in order to deliver the same on-demand and self-service benefits as the public cloud, but in a more affordable, secure and manageable manner.

"We have yet to find a workload that the AHV hypervisor can't handle, and its fully integrated with the rest of the Enterprise Cloud software making it easy to build the self-service portal we wanted and allow academics to provision their own resources."

– Ryan Kennedy,
Academic Computing Team Manager

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The decision was also taken to switch virtualization platform, from VMware to the AHV hypervisor included as part of the Nutanix Enterprise Cloud software stack. A bold move with the promise of huge cost savings, which has also paid off in terms of an easy migration and simpler, unified, management.

"Migrating old VMs to the Nutanix hypervisor was trouble free and we have yet to find a workload that AHV can't handle," commented Kennedy. "The AHV hypervisor is also fully integrated and managed from the same Prism console as the rest of the Enterprise Cloud software making it easy to build the self-service portal we wanted and allow academics to provision their own resources."

Another key reason for choosing the Nutanix Enterprise Cloud Platform, the integrated Prism Self-Service Portal (SSP) can be used by customers to build a custom web-based interface that empowers users to create and manage both VMs and storage directly. Much as they would using a public cloud platform, but in a strictly controlled and supervised manner. To this end administrators create projects to which they assign compute and storage resources, including shared VM templates and software images, for end-user consumption. Fine grained access controls can also be applied with additional tools to gather usage statistics and raise alerts when specific thresholds are breached.

Another important decision was to switch from legacy NAS storage to the integrated Nutanix Files – a software-defined scale-out file storage solution for unstructured data. This would enable the University to configure over a petabyte of usable storage using six load-balanced virtual file servers all in the same rack and managed from the same single pane of management provided by Nutanix Prism.

"As well as lower cost, speed and simplicity were seen as the main plus points of Nutanix Files. With our legacy NAS software, for example, new shares had to be setup by the support team using specialist interfaces but with Nutanix Files anyone can do it and it's easy to automate. It's also a lot quicker with shares available online in seconds and none of the performance bottlenecks associated with separate server and storage platforms."

RESULTS

Following an initial proof of concept trial using just five nodes, the scalability of the Nutanix Enterprise Cloud was immediately put to the test when one of the university's legacy IT infrastructure suppliers went out of business. Faced with having no support for key storage appliances an additional 10 nodes were quickly delivered enabling Kennedy and his team to migrate fully to the Nutanix infrastructure over a weekend and configure 400TB of storage in just 10 minutes.

"It was real eye opener," he said. "With our legacy storage it would have taken weeks to put in new servers and storage but once the Nutanix nodes were racked we just hit the expand button and, 10 minutes later, it was all done. Why couldn't we have done it this way before?"

As well as simpler scalability and enhanced storage performance, another benefit is much more efficient use of available storage with, in the case of Reading University a 16:1 reduction in physical storage overheads thanks to built-in deduplication, erasure coding and compression technologies.

That doesn't mean that extra nodes haven't been needed as according to Kennedy uptake of the Reading Research Cloud has been "massive" and is still growing. Despite that, there have been no availability issues with the Reading team opting to take advantage of the inherent redundancy of the Nutanix archi-tecture and use the integrated Cloud Connect capability to take snapshots to Microsoft Azure for backup and disaster recovery.

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NEXT STEPS

Team Manager Kennedy is hugely appreciative and proud of what the Nutanix Enterprise Cloud has allowed the University IT team to achieve, pointing to not just the scalability and ease of use of the platform as key enablers but the professionalism and high level of support provided by Nutanix and its partners. Support which, added to the inbuilt automation tools have enabled the University to build the self-service infrastructure they wanted and free up the support team to assist researchers with their projects rather struggling to keep the IT lights on.

"The Nutanix platform really has transformed the way we work," he commented. "Most of the time we don't even have to touch it – it just runs itself!"

That, however, doesn't mean job done and further development of the self-service portal is already underway, including the use of Nutanix Calm to extend the reach of the Research Cloud by building a hybrid infrastructure. To this end the recently acquired market-leading Calm technology adds native application orchestration and lifecycle management tools which will enable the Research Cloud to scale using, not just the on-premise infrastructure, but resources from Amazon, Azure and Google public cloud platforms all from the same unified self-service portal.

"Despite cost and data protection concerns there are times when the public cloud makes sense, especially where large workloads need to be handled at short notice," explained Kennedy. "So if an academic needs 100 cores tomorrow, Calm will allow us to burst into the public cloud to meet that need or use Amazon spot sales to get best value and will be a key component of our Self-Service Portal 2.0 going forward."

Technology aside, Kennedy also sees the Reading Research Cloud as instrumental in providing wider access to IT resources regardless of funding.

"When grants are awarded some of that money is now allocated to a central fund to scale the Research Cloud to the benefit of all regardless of project budget. It is also helping academics to obtain grants by giving them affordable access to a hugely capable infrastructure in order to produce the up-front collateral required to support their applications."

COMPANY SPECIFICS

Founded in the 19th century the University of Reading has become one of the foremost research-led universities in the UK. It has over 50 research centres, many recognised as international centres of excellence, in areas including agriculture, biological and physical sciences and meteorology.

INDUSTRY

Academic research

BUSINESS NEED

Deliver the scalability and agile self-service benefits of public cloud in a more cost-effective, secure and manageable way.

SOLUTION

- Nutanix Enterprise Cloud Software on Dell EMC XC Series
- AHV hypervisor
- Nutanix Files
- Nutanix Prism Self-service Portal and Calm

BENEFITS

- Linear scalability for affordable, fast and simple growth
- Agile on-demand delivery of compute/storage resources via self-service portal
- Significantly enhanced storage performance through compute/storage platform consolidation
- Up to 16:1 data reduction using integrated tools
- Use of AHV hypervisor eliminates need for costly virtualization licensing
- Single pane of management for all physical and virtual resources
- Ability to build a hybrid infrastructure using Nutanix Calm application orchestration tools

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T. 855.NUTANIX (855.688.2649) | F. 408.916.4039
info@nutanix.com | www.nutanix.com | @nutanix

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