Kennisnet: A lesson in data center success

Kennisnet is a public educational organization that supports Dutch primary, secondary, and vocational institutions in the effective use of IT by providing vision, expertise, digital learning materials, and infrastructure.

The challenge

In order to better serve roughly 2 million students and teachers, the team at Kennisnet needed 32 server racks. They were able to reduce that number to 16 by introducing virtualization to their data center. That helped increase efficiency and meet their needs at the time, but it wasn't enough to support future growth.

Kennisnet also needed to find a way for application developers to access a shared data center environment independently. The complexity of Kennisnet's multivendor architecture made this difficult.

To make things even more complicated, their main data center's I/O processors were reaching capacity handling 45 TB of information.

As Kennisnet prepared to retender its infrastructure services contract in compliance with Dutch public sector regulations, the organization's management decided to take a step back and develop a strategy that would invest in technology to improve efficiency and agility. As Dirk Linden, chief technology officer at Kennisnet, notes: "We were looking for a fully virtualized data center environment in which we could define separate customer domains with clearer allocation of responsibilities."

CUSTOMER
Kennisnet

INDUSTRY
Education

LOCATION
The Netherlands

EMPLOYEES
120

CHALLENGE
- Enable scalable and secure virtual data center services for education-related institutions.
- Find a cost-effective, high-performance alternative to public cloud offerings.

SOLUTION
- Community cloud built on FlexPod architecture, providing multitenant cloud services with server and application virtualization
- Shared infrastructure that gives application providers better control of service quality and delivery

RESULTS
- Agile and flexible infrastructure offering new capabilities from infrastructure as a service (IaaS) and platform as a service (PaaS)
- Time to market decreased from weeks to hours, with greater stability and assured availability
- Space requirements reduced by 87 percent; energy consumption cut by 90 percent

The solution

Kennisnet's first approach was to move to a public cloud, but they quickly discovered that none of the public cloud options they looked at could measure up to their financial and functional requirements, especially when it came to flexibility, scalability, and security. The team realized they would need a new purpose-built data center that could combine the best of public and private architectures: a secure infrastructure within an agile virtual environment.

Kennisnet found scalability and components that could be fine-tuned to meet their specific needs in a solution from Cisco. The Cisco® solution also uses cross-vendor-validated designs to ensure optimal setup. The solution, implemented and managed by Vancis, combines Cisco networking and compute platforms with fabric-attached storage arrays from NetApp.

The solution employs service profile templates so Vancis can easily change settings such as server firmware, VLANs, or boot policies while allowing a physical server's settings to be transferred to another device in the event of a failure. Plus, support is shared between the vendors so any incidents can be handled collaboratively.

Linden notes that "although the presence of NetApp, our preferred storage supplier, was an important factor, another key requirement was A-grade equipment, and the Cisco brand gave us the confidence we needed for this major innovation. Plus we had already used Cisco equipment for networking and collaboration, with positive results."

Another plus for Kennisnet was the fact that the Cisco and NetApp technologies came in a predesigned and prevalidated base data center configuration—FlexPod—which greatly reduced integration challenges. Says Linden, "The fact that end users didn't experience any downtime during such a major migration is a huge achievement." Educational, professional, and vendor application performance increased thanks to the way the Cisco Unified Computing System™ (Cisco UCS®) Integrated Infrastructure helps each part of the network work together.

The Kennisnet educational community cloud serves two purposes. First, it supports Kennisnet education services such as video sharing (Teleblik), federation (Kennisnet Federatie), content sharing (Edurep), Wi-Fi (eduroam), and online communities and portals such as Leraar24 and Mediawijzer.net. Second, the organization's 120 employees rely on the cloud every day for their office, finance, and document management and other IT applications. Kennisnet owns the fully virtualized cloud, and it is managed and hosted by Vancis.

The Cisco solution reduced energy consumption by

90%.

– Dirk Linden, CTO, Kennisnet

The results

Cisco technology is helping Kennisnet deliver an educational community cloud—or EduCloud—to educational institutions. It's more than just learning resources and applications; it's also IaaS and PaaS solutions. "Now we know exactly where our data is, we can better manage it," says Linden. "We simply couldn't have done that using a public cloud." Kennisnet's data center upgrades help IT deliver better outcomes across their business, from vendor integration and analytics to data storage.

Moving to a community cloud has also made it easier to satisfy privacy and security concerns and respond better to performance challenges. "If we hadn't built our new community cloud platform, customers would be noticing the difference right now," says Robert Klein, security officer and applications engineer at Kennisnet. "The stability of the platform is very good, and there's not been any downtime."

Perhaps more importantly, though, the cloud is also helping Kennisnet achieve a number of business agility benefits that would have been unthinkable before: Time to market for new applications has dropped. Previously, launching a new service could take weeks. With the EduCloud architecture, Kennisnet can launch a new service within an hour.

Server virtualization and consolidation is even reducing cost. The cloud hardware occupies just 2 data center racks, an 87 percent reduction on the 16 needed previously and a 94 percent improvement on the former 32-rack maximum. Power and cooling needs have also been reduced, to the point that Kennisnet is using its cloud deployment as a showcase for green IT practices. "We've seen a 90 percent reduction in energy use," Linden says.

The cloud has also let Kennisnet virtualize over 90 percent of its educational services, including apps for identity management and video-based learning, as well as critical business applications such as Microsoft Exchange, finance packages, and CRM.

"Previously, we conducted a business continuity study and concluded that we needed to build a second data center for disaster recovery, only it was too expensive," says Linden, "but building a backup data center with our standardized architecture is now much more feasible."

The virtualized nature of the infrastructure means individual servers can be be reinstated, or the entire data center to be rebuilt, from backup tapes stored offsite. "If our data center failed, it would be conceivable to build a completely new one within just one week," says Linden. "That wouldn't have been remotely possible before."

Next steps

The educational community cloud can be easily partitioned to form virtual data centers, not just for application developers, but also for Kennisnet customers in the education sector. Kennisnet is also considering replacing its existing wireless equipment with Cisco technology. "We are not a commercial organization, but we can now host content on behalf of other public organizations supporting schools in the Netherlands," says Linden. "The next logical step would be to introduce Cisco UCS Director, making it easier to provide and manage the converged infrastructure with one self-service web interface."

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— Robert Klein, security officer and applications engineer, Kennisnet

Technology

Data Center Solutions
FlexPod
· Cisco UCS B200 M3 Series Blade Servers
· VMware hypervisor software
· NetApp FAS3250 storage

Routing and Switching
· Cisco Nexus® 5000 Series Switches

Fabric Interconnects
· Cisco Nexus 6248 Series Fabric Interconnects

Cisco UCS® with
Intel® Xeon®
processors

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