Educational Community Cloud Supports Learning Excellence

Customer Case Study

Kennisnet creates flexible development and deployment environment, ensuring fast time-to-market for educational innovations

EXECUTIVE SUMMARY

Customer Name: Kennisnet

Industry: Education

Location: Netherlands

Number of Employees: 120

Challenge

- Enable scalable and secure virtual data center services for education-related institutions
- Find 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 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 with energy consumption cut by 90 percent

Challenge

Kennisnet is a public educational organization that supports Dutch primary, secondary, and vocational education institutions in the effective use of IT. It helps educational institutions take advantage of the opportunities offered by IT through four building blocks: vision, expertise, digital learning materials, and infrastructure.

To help support about two million students and teachers cost effectively, Kennisnet had introduced virtualization into its data center. Hosting around 240 virtual machines on some 25 physical servers had helped halve, from 32 to 16, the number of racks that it needed. However, that level of consolidation clearly would not support future growth in users and applications.

While it outsources most application development activity, Kennisnet partners with Vancis for data center and computing services. The organization was eager to find a way of giving application developers a shared data center environment that each could manage independently of Kennisnet and Vancis, but the complexity of its multivendor architecture had previously not made this approach viable. Furthermore, the organization's main Amsterdam data center was reaching its limits with storage array I/O processors at full capacity handling 45TB of information.

As Kennisnet prepared to re-tender its infrastructure services contract in compliance with Dutch public sector regulations, the organization's management decided to take a step back and review a strategy that would invest in technology to improve efficiency and agility.

Dirk Linden, chief technology officer at Kennisnet, says: "We were looking for a fully-virtualized data center environment in which we could define separate customer domains with clearer allocation of responsibilities."

Solution

Public cloud was the first avenue considered. However, after reviewing various options, Kennisnet found none measured up to its financial or functional requirements, particularly in terms of flexibility, scalability, and security. The company realized it would need a new purpose-built data center, and a Europe-wide request for proposal (RFP) was issued for a community cloud solution. Taking the best of public and private architectures, this solution would enable secure infrastructure sharing within a virtual and agile environment.

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Dirk Linden
Chief Technology Officer
Kennisnet

Kennisnet chose a Cisco® solution due to its flexibility in sizing and fine-tuning components, while making use of cross-vendor validated designs to ensure that the complete stack is set up properly. The solution, implemented and managed by Vancis, combined Cisco networking and compute platforms with fabric-attached storage arrays from NetApp.

The solution employs service profile templates that allow Vancis to easily change settings such as server firmware, VLANs, or boot policies, while at the same time allowing a physical server's settings to be transferred to another device in the event of a failure.

Another advantage is that support is shared between the solution vendors. This arrangement provides a single point of contact and allows incidents and problems that cannot be attributed to a particular device to be resolved in a collaborative fashion. "We wanted the capability to build virtual data centers, combining availability and scalability in a flexible and secure environment," says Linden. "Vancis offered the best complete package."

He adds: "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."

A plus for Kennisnet was the fact that the Cisco and NetApp technologies came in a pre-designed and pre-validated 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."

The fully virtualized cloud infrastructure is owned by Kennisnet but managed and hosted in Amsterdam by Vancis, which also carried out the implementation and migration processes.

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 Leraar 24 and mediawijzer.net. Second, the organization's 120 employees rely on the cloud every day for their office, finance, document management, and other IT applications.

Results

The Cisco technology is enabling Kennisnet to deliver an educational community cloud or so-called EduCloud to members of the educational establishment. That's not just learning resources and applications, but also infrastructure-as-a-service and platform-as-a-service 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."

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. For example, time-to-market for new applications has dropped substantially. Previously, launching a new service would have meant coordinating the provision of infrastructure assets from a number of suppliers, a process that could take weeks. With the EduCloud architecture, Kennisnet can launch a new service within an hour if needed.

Meanwhile, server virtualization and consolidation help Kennisnet run its community cloud at minimal cost. The cloud hardware occupies just two 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 have also been significantly 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.

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The cloud has also enabled Kennisnet to 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. Apart from such immediate benefits, the new solution has opened many other advantages

"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."

However, that backup center now might not be necessary because the virtualized nature of the infrastructure allows individual servers to 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. In addition, 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."

For More Information

To learn more about the Cisco architectures and solutions featured in this case study, go to: www.cisco.com/go/flexpod

Product List

Data Center Solutions

- FlexPod
  - Cisco UCS B200 M3 Series Blade Servers
  - VMware hypervisor software
  - NetApp FAS3250 Series storage

Routing and Switching

- Cisco Nexus® 5000 Series Switches

Fabric Interconnects

- Cisco Nexus 6248 Series Fabric Interconnect

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