

THE BEST OF BOTH WORLDS: KOBLENZ REGIONAL TAX OFFICE BENEFITS FROM THE USE OF NEXSAN STORAGE THANKS TO THE ADVANTAGES OF VIRTUAL STORAGE

Koblenz Regional Tax Office was facing the challenge of developing the technical basis for the imminent launch of a nationwide standardized tax software. One of the basic requirements was to create sufficient dedicated data storage. This proved to be impossible with the existing storage system that had a limited capacity of 16 terabytes in its final version and was almost exhausted, especially as the currently ongoing server virtualization and operation of a constantly growing number of virtual machines also required an adaptable storage concept. It was therefore a logical conclusion to change the complete system to a flexible, high-performance and robust storage infrastructure. The combination of the SANsymphony DataCore virtual storage software and the high-performance, high-density and highly scalable Nexsan SASBeast systems proved to be ideal from a technical and economic point of view.

STORAGE ENVIRONMENT

- Redundant, central storage network spread across two separate computer rooms and linked via fiber channel
- Class A storage: 8 Nexsan E48 systems, fully equipped with 48 SSD and SAS hard drives per chassis (9 x 200GB SSD and 39 x 15K/450 GB SAS storage capacity), RAID 10 in combination with hot-spare drive
- Class A storage: 2 Nexsan E48 systems, fully equipped with 48 SAS hard drives per chassis (48 x 15K/600 GB storage capacity), RAID 10 in combination with hot-spare drive
- Class A storage: 20 Nexsan SASBeast, fully equipped with 42 SAS hard drives per chassis (16 x 15K/450 GB and 4 x 15K/600 GB storage capacity), RAID 10 in combination with hot-spare drive
- Linking the Nexsan storage systems through four Brocade DCX-8510-8 fiber channel directors each; these are divided into two fabrics with two Brocade DCX-8510-8 each:
 - › Two VMware vSphere 4.1 server farms (current operation of over 1,200 virtual machines of which approximately 1,150 are stored on Nexsan Storage.)
 - › Six storage domain controllers on which the SANsymphony virtual storage software by DataCore is being run, of which four run Nexsan Storage.



CASE STUDY 2

CUSTOMER

Koblenz Regional Tax Office was established in 1950 and is the intermediate tax authority of the Federal State of Rhineland-Palatinate. The office, which is technically a subordinated part of the capital and transfer tax department as well as the salaries and pensions office, to which the central state treasury and the federal construction department are also allocated, is answerable to the Ministry of Finance of the Federal State of Rhineland-Palatinate. It is also responsible for supervising the 26 tax offices and state field offices operating in 37 locations as well as one university of applied sciences. Around 7,900 employees at Koblenz Regional Tax Authority currently process the tasks arising in their areas of responsibility in close proximity to the populace. The “central data processing department of the tax office”, CDP for short, provides the required technical basis, such as the management of the entire IT system, including server infrastructure, on which the various applications used in the daily working environment are run.

THE CHALLENGE:

Combating limited storage capacities

EOSS is the name of the program that is to pave the way for the use of one nationwide, standardized tax office software. Its aim is to improve the profitability of administration. In the run-up to the switch to the new solution, whose initials stand for “Evolutionär orientierte Steuersoftware” (evolution-oriented tax software), the Koblenz Regional Tax Office had to take the appropriate steps to ensure a smooth transition. This was no mean task: on the cutoff date on June 1, 2010, around 40 million data sets had to be transferred from the last decade of taxation process to the new system.

The first step was to address the basic requirement of providing sufficient storage space. Six dedicated terabytes of storage space had to be made available for the structure of the obligatory EOSS reference environment alone. As the total capacity available at Koblenz Regional Tax Office at that time was a mere 12 terabytes, it was impossible to implement this requirement with the SAN storage that had been linked to the mainframe up to that point. With its 16 terabyte limit in its final version, there was barely any leeway left for expansion, which made it imperative to change the system. At the same time, the virtualization of the server landscape was already in full swing and the parameters linked to the storage infrastructure changed considerably. The operation of a rising number of I/O-intensive virtual machines on the physical servers and their SAN connection required adequate storage that should neither increase the complexity of the IT system nor the administrative input.

STORAGE ENVIRONMENT

- Class B storage: 8 Dell MD1000 systems with 15 SAS harddrives each
- Class C storage: 2 Dell MD1000 systems with 15 SATA harddrives each
- Class B and C storage are both directly linked to the DataCore server
- Synchronized data mirroring between the computer centers
- Linking the field offices via 10 MB cables

In view of the above, the decision-makers at Koblenz Regional Tax Office resolved to implement an entirely new storage concept. The most important measure was to create the basic requirements for the migration, but the system should also be as flexible and cost-effective as possible in terms of reacting to the expected annual rise in data volume in the future. Based on data growth of 10 to 20 terabytes per year, the new storage landscape should be scalable at any time and easy to manage, even after an expansion. Performance was also an extremely important factor. It had to still be ensured, after all, that more than 5,000 users with different I/O requirements in their daily business continued to have uninterrupted access to the 1,000 plus virtual servers in operation and the applications that run on them.



We realized at an early stage that our existing IT landscape provided insufficient options in terms of growth. We therefore decided to change the complete system to a virtualized server and storage environment and to implement a tiered storage model. When selecting the primary storage, we quickly found that Nexsan's solutions are a premium option. They are ideal for the combined use with the DataCore SANsymphony virtual storage software and based on the cost of the I/O performance provide better value for money than other products in this class. //

DIETER DEFFNER

HEAD OF CLIENT AND SERVER SYSTEMS AT KOBLENZ REGIONAL TAX OFFICE

SOLUTION:**Highly scalable, space-saving Nexsan SASBeast systems**

The new storage system developed by CDP's server team in Koblenz in close cooperation with its long-standing IT service provider focused on realizing a state-of-the-art, and therefore future-oriented, SAN infrastructure. Its aim is to optimize and improve processes and to ultimately increase efficiency across various areas. High performance and reliability therefore became increasingly important, both in the design of the IT environment and the selection of a suitable SAN solution. Profitability was another key factor – from the initial investments to the subsequent costs related to the maintenance of continued operations. The assumption of the central basic concept at the linked tax offices and field offices, which was planned to a lesser extent (server and storage virtualization in connection with redundant storage), promised to create synergies thanks to similar functionalities and a resulting standardized workflow.

As part of the replacement of the existing SAN and the switch to a tiered storage model, the decision-makers at Koblenz Regional Tax Office resolved to implement the SANSymphony virtual storage software by DataCore. This provided the foundation for dividing the physical storage into virtual units, regardless of the underlying technologies, and to merge them in a centrally managed pool. In addition to ultimate flexibility when selecting SAN components in the future, the option of synchronously mirroring stored data between the breakdown-proof DataCore servers operated in two computer rooms was a deciding factor. In the first eight months of the project phase, the application was initially implemented and class B and C storage systems were directly linked to the storage nodes. At the same time, the potentially suitable class A storage, which should be exclusively reserved for applications with high I/O requirements, was evaluated. This led to the inevitable result that primarily extremely powerful systems with high I/O performance were assessed in more detail. High drive density was also one of the required criteria as all SAN components had to be housed in the two computer rooms in a confined space. Last but not least, factors such as adequate expansion options that ensure equally simple management played a deciding role in the final decision. It quickly became clear that Nexsan SASBeast perfectly matched all requirements.

“The 24,000 input/output operations per second (IOPS) measured in test runs fully matched the promised performance,” comments Dieter Deffner, Head of Client and Server Systems at Koblenz Regional Tax Office and project manager. “ This in itself is a success because it is often quite uncertain if the figures stated by the manufacturer will actually turn out to be true in real life. Nexsan SASBeast also offers much better value for money than other systems we also considered. The costs in relation to I/O performance are considerably lower than those of comparable products.”

Today, Koblenz Regional Tax Office runs a fully redundantly structured SAN environment. Around 1,200 virtual machines managed with VMWare VSphere 4.1 are currently being operated on two server farms consisting of more than 120 physical servers each. Of these virtual machines, 50 are linked via fiber channel to the fast Nexsan SASBeast systems physically installed at the computer center, which provide a gross hard drive capacity per combination of 285 terabytes, or 316 terabytes, 128 net terabytes, or 141 terabytes for the storage of the data generated by the key production applications with high I/O requirements. These are primarily the EOSS software run on the Linux and Windows terminal servers as well as Oracle databases and the web-based ticket system. The remaining virtual machines are divided across the class B and C storage directly linked to the DataCore server. Brocade directors with transfer speeds of 16 GBit/s serve as interfaces between the server farms and the Nexsan primary storage as well as the DataCore server. The physical machines are linked at 8 GBit/s. Both computer centers are redundantly linked at 2 x 64 GBit/s. The infrastructure also includes the 54 physical servers installed at the 27 tax offices that are linked in a star formation with the central office in Koblenz and which serve as small virtualization instances.

Dieter Deffner's explanation for choosing Nexsan: “The main reason for us choosing Nexsan was that no other storage system on the current market works as perfectly with other virtual storage solutions. SASBeast is also very suitable in terms of expansion with small space requirements, whilst maintaining the already simple management structure.”

RESULT:

An uncomplicated, high-performance storage infrastructure that adapts to increasing requirements

In hindsight, the switch of the entire storage landscape on account of the imminent migration to EOSS was a complete success for Koblenz Regional Tax Office. Based on the well thought out concept, the internal IT team and its service partners realized the new infrastructure in the shortest possible space of time and thus managed to provide the required additional storage before the statutory deadline. The simplicity of all Nexsan systems, in particular, was a winning feature, from purchasing, hardware structure and the uncomplicated implementation of capacity expansions in the near future right through to management. The harmonized interaction with the DataCore virtual storage software, which ensured efficient use of the storage provided by the Nexsan SASBeast combination, was also a great benefit in the eyes of the responsible parties.

“It became clear straight away during the evaluation that the Nexsan systems would meet our expectations – especially in the required combination with DataCore SANsymphony,” comments Dieter Deffner. “We managed to fully exhaust all of the software’s functionalities with a comparatively low financial effort.”

The IT team at Koblenz Regional Tax Office is particularly amazed that 42 drives fitted into just four rack units. This made it possible for them to create a lot of capacity within the smallest possible space. The rack is still not full to capacity despite expansions having been implemented continuously since the end of 2009 and there still is room for two additional Nexsan SASBeast systems. By comparison: in a similarly structured installation environment, the solutions by another manufacturer do not provide the same amount of drive space but use up three times the amount of physical space.

“Even though it may sound unusual, we use far more of the fast A than the B and C class storage today,” comments Dieter Deffner further. “This is simply because the Nexsan systems run extremely well. We now run all virtualized central Unifa dialogue terminal and tax office application servers on the primary drive to provide the Thin Clients used by the tax offices with access to the EOSS application. This approach currently still sets us apart from all other tax offices in Germany.”

ADVANTAGES

- Fully compatible for use in virtual environments
- High degree of performance and reliability
- Excellent value for money
- Large capacity within the smallest space – up to 42 drives can be installed in four rack units
- Simple operation – uncomplicated installation and configuration and easy management
- Can be directly integrated in existing fiber channel and iSCSI environments
- Does not depend on operating systems, no specific drivers are required for installation and start-up

The greatest advantages experienced by the intermediate tax authority so far since launching the Nexsan systems include:

- Scalability: Koblenz Regional Tax Office can quickly, simply and cost-efficiently expand the existing system with further fast drives and thus react flexibly to the growing capacity requirements of I/O-intensive applications.
- High performance: The redundantly structured system architecture, including the existing independent dual RAID controllers, provides high performance, reliability and uptime when combined with active/active-failover functions.
- High density: Up to 42 drives can be integrated in just four rack units.
- Ease of maintenance: The redundant design of the storage and virtual storage makes it easy to maintain the system at any time.
- Can be combined with virtual storage solutions: Creating user-defined volumes makes it possible to tailor a solution for a large variety of applications and therefore optimally utilize the available storage.

“The Nexsan SASBeast systems meet all criteria that are important to us, especially when combined with DataCore software. The hardware has a simple structure and is therefore easy to manage and administer. This provides us with the fast but at the same time almost maintenance-free storage that we require for our purposes. I don't know any other product that offers all this,” says Dieter Deffner.

ABOUT IMATION

Imation (NYSE: IMN) is an international company specializing in data storage and information security. Our products and solutions help organizations and private customers to store, manage and protect their digital content. Imation's storage and security portfolio includes Nexsan high-density, archive and solid-state optimized unified hybrid storage solutions; IronKey mobile security solutions that address the needs of professionals for secure data transport and mobile workspaces; and consumer storage solutions, audio products and accessories sold under the Imation, Memorex and TDK Life on Record brands. Imation reaches customers in more than 100 countries through a powerful global distribution network. For further information, please visit www.imation.com.