

► Challenge

To find a cost-effective, feature-rich storage solution that could guarantee uninterrupted access to increasing data volumes and applications on a long-term basis.

► Solution

With the most important aspect here being storage virtualization, the “heart” of the SAN concept, the decision was made to choose SANRAD’s V-Switch 3000 iSCSI switch, connecting to two mirrored 1.3TB SATA disk arrays.

► Benefits

- Significantly reduced administration costs
- Drastic increase in the efficiency of the storage procedures
- iSCSI alternative much more cost-effective than Fibre Channel
- Using established SCSI protocols significantly simplified management for network administrators
- The V-Switches operated at a performance level that actually exceeded the requirements of Germania’s IT department
- Compatible with wide range of storage arrays and server operating systems

“The central storage virtualization via the SANRAD V-Switches has proven to be a major benefit in the transition to the operational phase, enabling us to migrate the individual applications to the iSCSI SAN environment on a step-by-step basis without affecting the normal operation of the system.”

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SAN Installation at Germania Airline

Full throttle for storage management

The challenge

The continual expansion of business at Germania Airline made the consolidation of the IT structures an unavoidable necessity, particularly with regard to storage management. Fast, continuous access to information was becoming increasingly important for all areas of the company. Against this background the data backup based on Direct Attached Storage (DAS) was no longer a state-of-the-art solution. Each application server wrote data to its own storage disks so once the storage space available at one location was exhausted disks had to be added while resources at other locations remained unused. That led to significant administration costs but no increase in the efficiency of the storage procedures. This was compounded by the disadvantages for backup and restore specific to DAS. The processes operated via the network so its performance was dependent upon the level of network capacity and utilization by other processes. Given these conditions, it was no longer possible to guarantee uninterrupted access to increasing data volumes and applications on a long-term basis.

The concept

Germania’s IT demanded server and data consolidation at one central IT location (Berlin) and permanent availability. The only way to realize these requirements in an appropriate way was through a dedicated storage area network (SAN). Distributed (physical) storage resources are “logically” combined within this as server-independent units through virtualization. This means that all connected servers are able to access available storage space. The actual composition of the “virtual” volumes in terms of disk type (manufacturer, storage protocol, configuration, e.g. JBOD, RAID) is irrelevant. This enables heterogeneous storage resources to be utilized without cutbacks and assigned on demand.

A SAN traditionally uses Fibre Channel technology as a connection path. This protocol brings with it the highest transfer rates of any network standard. However, FC networks are costly to operate, and the infrastructure required (e.g. host bus adapter, switches, routers, fibre-optics) is relatively expensive. It is all the more expensive if several switches are connected to a so-called Fibre Channel Fabric as backup in the event of a failure.

The solution

Having decided on the iSCSI SAN, the Germania IT team, together with eSeSIX and a Berlin-based systems company, started work on the evaluation of suitable solutions for storage management. The most important aspect here was the virtualization capability, the "heart" of the SAN concept. The decision was made to choose the V-Switch 3000 from the San Francisco-based SANRAD. The solution operates in-band, in other words within the storage network between host server and storage resources. The system's configuration and administration is carried out via a browser-based interface (GUI).

The realization

After conducting thorough performance tests of the V-Switch solution in the new 1GB Ethernet-iSCSI SAN, two test installations started in February 2004. The first one focused on the interoperability between the SQL database, one individual V-Switch and the disk array via the iSCSI network. The criteria used for the assessment was whether the SQL server could handle the accesses to the virtualized storage units without any latency. The second test installation consisted of two V-Switches and two SATA disk arrays (Serial ATA - standard for high performance data transmission) from eSeSIX' MORPHOIS disk array series in an active-active configuration which was also to be put into operational use. This ensures the system's high availability in the storage operation. Each switch serves its own clients. Should one fail the other automatically takes over its services. Both tests were completed without any problems. The V-Switches and SATA disks operated via iSCSI throughout at a performance level that actually exceeded the requirements of Germania's IT department. The next step on the agenda was the migration from test to operational environment, which began in July 2004. The last servers were incorporated into the iSCSI network in February 2005.

The end result

To date, the SAN conversion and storage management based on the SANRAD switches have fulfilled Germania's expectations in every respect. The installation was carried out independently. The system was operationally ready in just half a day. The definition of the storage volumes and creation of the data mirror also went smoothly. The entry into the iSCSI world also posed no problems. Two 1.3 terabytes (mirrored) and 1.3 terabytes are currently administered as a backup area at Germania via the new iSCSI structure. The effective volume used is 345 gigabyte.

The outlook

The SAN structures at Germania will continue to be expanded in accordance with requirements. In this context it is intended to utilize the multi-pathing function of the SANRAD switches. In order to increase the fail-over capability of the entire system a server can reach an iSCSI LUN by several paths (LUN: Logical Unit Number assignment number for activating devices). A second area is the use of the snapshot technology for LANfree backup for which no additional license fees will be payable with the SANRAD solution. Snapshots are point-in-time data images which can be quickly backed up and restored in the iSCSI SAN so that these storage management processes do not affect the operation of the network in the LAN.