High Availability at Danfoss through Logical Partitioning.

Danfoss Interservices GmbH (DESCI), with headquarters in Offenbach / Main, is the German subsidiary of Danfoss A/S of Nordborg, Denmark. It specializes in the business areas of merchandising and information technology, which it offers as an IT service provider exclusively to the German subsidiaries of Danfoss A/S. Its eight employees independently service an IT landscape with about 350 users.

In July 1999, DESCI was the first company in the world to enter an uncharted area of technology: it successfully installed SAP R/3 on the logical partition of an IBM AS/400 server.

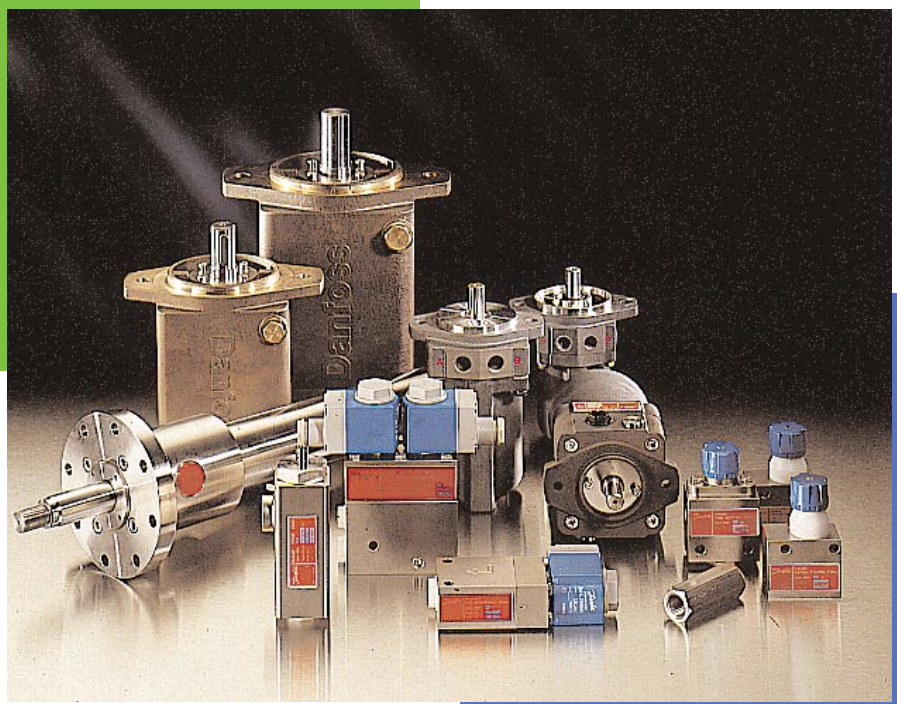
Release 4 of the operating system OS/400 Version 4 has been providing completely new possibilities on the IT landscape since May 1999. A special feature is logical partitioning (LPAR) – even on a multi-path AS/400 server – so that up to 12 servers can be operated at one time. Independent of one another, each of the servers has its own CPU, working memory and mass memory. This provides an ideal solution for server consolidation, consolidation of business units, mixed production and test environments, as well as integrated clusters.

Since 1986, Danfoss has been working with an IBM /38; in June 1988, the first IBM AS/400 was added. The software used was an application produced by Steeb, now a subsidiary of SAP. In order to increase the performance and transparency in the control and monitoring of all production steps and processes, company management decided to replace old systems with SAP R/3.

Technological skills for integrated company solutions

Gerhard Walter, head of Information Technologies at DESCI, sees the AS/400 with its high reliability as an ideal complement for the complex application SAP R/3. It ran on the S40 server with 12 processors; in tests, however, the second system with four processors was used. Numerous additional applications ran in parallel with the OS/400 and DB2/400.

Industry	Manufacturing
Application	SAP R/3 Modules FI, CO, AM, HR, PP, MM, SD
Software	OS/400 DB2/400
Hardware	IBM AS/400 Model 740 IBM AS/400 Model 730



Since 01.01.1998, DESCI has been working successfully with the Financial Accounting (FI) and Controlling (CO), Personnel (HR), Asset Management (AM) modules, and in part also with Production Planning (PP). On 01.01.1999, the Sales (SD) and Material Management (MM) modules were installed. Thanks to the SAP R/3 modules, the head of Information Technologies at DESCI sees no further risks with the introduction of the Euro and the Y2K problem.

However, for Gerhard Walter, the great advantage of the IBM AS/400 is "the parallel operation of the database and application servers. This simplifies the administration and makes a separate application server for SAP R/3 superfluous. The numerous functions and the loss-free performance of the hardware and software prove that the decision in favor of AS/400 and SAP R/3 was correct."

"Compared to other systems, AS/400 is more cost-effective in the long term; above all, it is significantly more secure. System administration and database management have always been an advantage of the AS/400. With SAP R/3, this is accentuated even further."

Gerhard Walter, head of Information Technologies at DESCI

In order to achieve the optimized high availability of the system, which until now has only been possible with the addition of a server, DESCI decided to use LPAR to re-partition both of the IBM AS/400 servers.

Rapid implementation of hardware and software

The upgrading of the AS/400 from S40 to 740 and the 53S to 730 was achieved over a single weekend at the beginning of July 1999. Afterwards, routine operation continued for one week on the system under OS/400, Version 4, Release 3. Next, Release 4 was installed on the 730, followed by the LPAR partitioning into two systems, each with two processors with two gigabytes of main memory. In LPAR2, the existing test system was adopted and SAP R/3 was tested under the new conditions. SAP R/3 was then installed on the 730 and set into operation.

At the end of July, software from DataMirror was used to create a synchronization of the 740 production server data pool in LPAR1 of the 730. This meant that the goal of high availability through two identical systems and the test system was achieved. After successful conclusion of the work, the second server was moved to the neighboring building to assure not only physical separation but also to form a spatial separation of two separate units.

Maximum flexibility for optimum requirements

If the production server fails, the backup is activated. The test system is also blocked and the backup is configured with four processors and four gigabytes of main memory. While this system is maintaining production operations, the necessary corrections can be made to the production server. New data is imported by means of DataMirror and is then available to the production system without loss.

Gerhard Walter sees the greatest advantage of LPAR in the high degree of flexibility for changes to the IT landscape. It makes no difference whether it is a modification due to growing business processes or new IT components. Danfoss Deutschland can react in the best possible way at any time to any challenge.

Danfoss A/S, with headquarters in Nordborg, Denmark, is known to everyone through its automatic radiator thermostats. This is only one of 17 product lines which Danfoss manufactures worldwide and markets locally.

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