High Availability Cluster with ZFS-based Open-E JovianDSS for one of the leading research organizations in Europe

The Max Planck Institute of Molecular Plant Physiology (MPI-MP) was founded in 1994. From originally only 16 employees the institute grew into a large institute, which now employs about 360 people who put their combined efforts into elucidating the secrets of plants.

In the first years the scientists performed their research in buildings on the campus of the University of Potsdam. In 1999 the construction activities on the Max Planck Campus were completed and the MPI-MP, together with the Max Planck Institute of Colloids and Interfaces and the Max Planck Institute for Gravitational Physics, moved into their new buildings. The three institutes share a central building with a lecture hall, seminar rooms, administration offices and a cafeteria. Apart from that, they are completely independent from each other.

EUROstor, a manufacturer of storage systems who's main part of the product portfolio are server based systems, acting as flexible storage servers, tailor-made for the customers' needs, has created a long-term business relationship with Max Planck Institute, supplying systems to this customer since 2007. Willing to provide their customer with the best solution they have decided for an Open-E product, not only because of the performance-price ratio, but also because the product has met all the strict requirements.

Solution

The Max Planck Institute of Molecular Plant Physiology was looking for a High Availability solution that is easily extensible and offers both NAS and iSCSI. A ZFS file system would be an additional asset as it offers an extra high degree of security against file system errors, which is particularly important for very large amounts of data. EUROstor, as a Platinum Partner of Open-E with many common and successful cluster solutions has made an obvious choice of ZFS- and Linux-based Open-E JovianDSS Data Storage Software to be implemented in the research institution's storage environment.

The solution consists of a cluster node of two servers with dual Xeon processor (3.5 GHz), 256 GB RAM, 8 x 12 Gbit SAS on each of the JBODs.
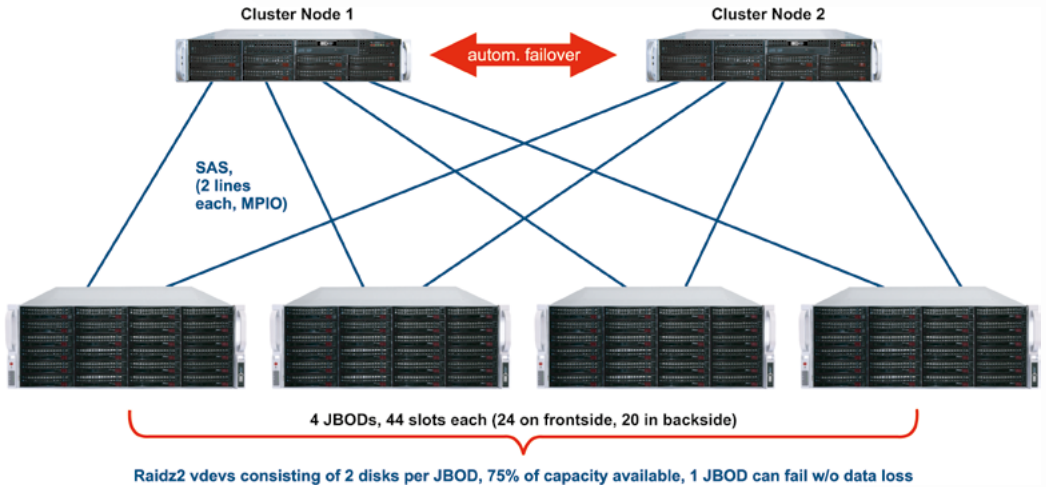Four JBODs each with 44 x 3.5" disk slots, each equipped with 24 x 4TB nearline SAS disks are redundantly connected to both cluster nodes. The disks are merged into raidz2 vdevs with 2 disks per JBOD. This results in 6 + 2 redundancy (75% available gross capacity), which can result in a complete JBOD without interrupting availability.
There is 235 TiB of storage space available, added to this are write and read caches (ZIL, L2ARC) on mirrored SAS SSDs. Open-E JovianDSS provides continuous availability of all data and allows the institute to maintain all operations even if critical situations or disasters appear.

Now the system represents the central storage pool of the institute. It holds the storage space for a virtual server environment with about 100 machines, but also provides iSCSI storage targets for hardware-based file servers, which can be used for example provide the home directories for plenty of users, which was a must as from 16 employees the institute grew into 360 people from all over the world.

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Hardware setup

Cluster Node 1   autom. failover   Cluster Node 2

SAS, (2 lines each, MPIO)

4 JBODs, 44 slots each (24 on frontside, 20 in backside)

Raidz2 vdevs consisting of 2 disks per JBOD, 75% of capacity available, 1 JBOD can fail w/o data loss

Customer feedback

Carsten Bochan, *Head of IT*

„We chose this solution because of its best-in-class features. Open-E JovianDSS is based on the ZFS file system which is easy to configure and manage. High Availability provides us with the sense of security, as we can rest assured that our data is fully protected even in case of a serious error. We've been using this system already for a year and our experience of this product is very positive, as it is stable, robust and offers great performance."

About Max Planck Institute

The Max Planck Institute of Molecular Plant Physiology (MPI-MP) was founded in 1994 by Prof. Dr. Lothar Willmitzer, who is the director of one of the three departments which have been established since then.

Since the institute was founded the main emphasis of the institute has shifted from the analysis of central metabolic pathways combined with the analysis of gene function to the development and implementation of phenotyping technologies and system approaches. This Systems Biology approach is driven by a close interaction between experimental and computational scientists who work side by side in the institute.

More information about the research interests of the various groups can be found in the Research section of this website: **https://www.mpimp-golm.mpg.de/**

About EUROstor

EUROstor has been a manufacturer of storage systems for more than 12 years. Originally manufacturing RAID systems, today the main part of the product portfolio are server based systems, acting as flexible storage servers, tailor-made for the customers' needs. Solutions range from small file servers and CCTV storage to high available storage clusters, scale-out clusters and cloud solutions. EUROstor, located in Filderstadt near Stuttgart (Germany), sells to professional end users all over Europe, SMBs, universities and research institutes and data centers. More information on . More information on **www.eurostor.com**

About Open-E

Open-E, founded in 1998, is a well-established developer of IP-based storage management software. Its flagship product Open-E JovianDSS is a robust, award-winning storage application which offers excellent compatibility with industry standards, and is the easiest to use and manage. Additionally, it is of the most stable solutions on the market and undisputed price performance leader.

Thanks to its reputation, experience and business reliability, Open-E has become the technology partner of choice for industry-leading IT companies. Open-E accounts for over 30,000 installations world-wide and has received numerous industry awards and recognition, also with its product Open-E DSS V7.

For further information about Open-E, its products and partners, visit **http://www.open-e.com**

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