



University of Würzburg brings scalability to its data centre

Integrated HPE server and storage solution
manages increasing data volumes

Objective

Installing a flexible, scalable server and storage infrastructure that could store and archive fast-growing data volumes quickly, securely and reliably

Approach

Extensive consultation and workshops with HPE and its partner Bechtle

IT Matters

- Having a highly automated solution from a single provider relieves strain on the IT administrators
- Fast overnight backup creation using LTO-6 tape drives
- Expanding the solution is fast, flexible and cost-effective

Business Matters

- High stability and availability of the entire storage and server environment for teaching and research
- The solution puts the University in an excellent position to be able to cope with ever-increasing data volumes and future applications
- There is one, single point of contact in the event of an issue as the entire solution is provided by HPE



When dramatic increases in data volumes began to push the existing storage and server infrastructure to its limits, the team decided to look for a modern, flexible and scalable replacement. They found it in an integrated solution from HPE comprising two HPE 3PAR StoreServ 7400 systems and two HPE StoreEver ESL G3 tape libraries with LTO-6 tapes.

Challenge

Increasing data volumes create capacity bottlenecks

The University of Würzburg's data centre is its central IT service provider. Its 50 employees provide IT services including system operation, network and communication, consultation, information, training and multimedia services, to the University's 28,000 students and 4,000 research and teaching staff across its various faculties and institutes. Founded over 600 years ago, the University offers courses across a wide range of subjects. Accompanying its traditional fields of medicine, theology, philosophy and law are now a number of new areas of study, including nanostructure technology, functional materials, biomedicine, digital humanities, media communication and human-computer systems.

“With the two HPE 3PAR StoreServ 7400 and HPE StoreEver ESL G3 tape libraries with LTO-6 tapes, we now have a large enough buffer to be able to cope with the increasing data volumes our faculties will generate over the next few years.”

– Dr. Matthias Reichling, deputy data centre manager and centralised and decentralised services manager,
University of Würzburg

The data centre works closely with a number of external IT service providers. Each user at the University is assigned their own central directory. The data they store is always backed up and they have the option to archive their data if they need to.

The data centre currently operates some 40 standalone servers and 48 blades (Linux, OES, Windows® Server and ESXi clusters), multiple VMware ESXi clusters for over 300 virtual servers – running entirely on HPE blade technology – and around 300 virtual desktops. The entire data centre infrastructure has long been based on a complete Hewlett Packard Enterprise solution comprising servers, storage and network components. “We’ve always had excellent experiences with HPE hardware and fantastic service from its partner Bechtle. The environment is highly available and very stable,” says Dr. Matthias Reichling, deputy data centre manager and centralised and decentralised services manager at the University of Würzburg. “So we were very happy that we were able to continue working with both of them when it came time to replace our existing IT infrastructure, which was bursting at the seams. The presales advisors have also got to know us well over the years and always provide fast answers to our queries.”

The existing storage environment – comprising two HPE EVA storage arrays and two HPE ESL 712 LTO-4 tape libraries housed in two separate data centre rooms – had finally reached its limits. There was 300 TB of data in the storage area network (SAN). “Over the past ten years, our data volumes have increased by a factor of 12. And we’re expecting it to grow even more in the coming years,” says Reichling. “We can’t tell exactly how much as it depends on the projects our faculties have planned – and we often have no idea when they’re coming.”

Many faculties are using applications that are beginning to generate larger and larger volumes of data. “The resolutions of the cameras, microscope and measuring devices that many of our faculties use have increased dramatically in recent years,” continues Reichling. Histological tissue samples, for example, easily generate images of 100,000 x 100,000 pixels. And as they are often in colour, file sizes can be anything up to 30 GB or more. Experts predict that data volumes produced by imaging software will approximately double every three years.



Solution

A complete HPE server and storage solution

“We need an IT infrastructure that allows us to react very flexibly to a wide variety of applications,” explains Reichling. Which is why the University consulted Bechtle and HPE, took part in workshops with them and even visited the HPE Lab in Böblingen before finally deciding on a scalable, integrated HPE solution consisting of storage devices, servers and Fibre Channel network components. The new setup comprises two HPE 3PAR StoreServ 7400 storage systems, two HPE StoreEasy 3000 Gateway Storage devices and two HPE BladeSystem c7000 housings with 36 HPE ProLiant MicroServer Gen8 blade servers. Backups are created using two HPE ProLiant DL380 Gen9 servers. Existing backup tapes have been migrated to two HPE StoreEver ESL G3 tape libraries with LTO-6 tape drives and media.

The archive server is used for long-term storage of large data volumes. The user must actively trigger the data to be archived themselves, for example when they finish their research projects. The Deutsche Forschungsgemeinschaft requires primary data to be archived for ten years.

Users can also store their data on fast disk drives. Backup servers take regular copies of the data, and the institutes’ servers can also be backed up if required. Archive and backup servers write the data to the two HPE ESL G3 tape libraries which are housed in machine rooms in different buildings. “This dramatically increases our data security in the event of a disaster as the two rooms are over 700 metres apart,” says Reichling.

Benefits

Flexibly scalable for every research and teaching application

The two HPE 3PAR StoreServ 7400 devices currently have a data capacity of 800 TB, but can be expanded by adding additional drives at any time. “This means that we have a large enough buffer to be able to cope with the increasing data volumes our faculties will generate over the next few years,” says Reichling, confidently. Much of the data is mirrored between the two HPE 3PAR StoreServ 7400 devices using the HPE 3PAR Replication Suite software to ensure high availability. Reichling: “We decided not to mirror mass data for cost reasons, but all of our other data is duplicated on tapes.”

At the University, large data volumes are mainly generated by automated applications using measurement devices or cameras. “Our new, modern architecture means we are now able to cope with applications like this. We even have enough of a buffer in both the SAN and tape libraries for the next two to three years, but we can add additional capacity flexibly and cost-effectively if we need to. This is very reassuring for us,” says Reichling. While the amount of space in the old tape library was limited to 698 slots per frame, the University of Würzburg data centre now has four frames with 1,500 slots, which can easily be expanded to up to 12,000.

Customer at a glance

Hardware

- 2 x HPE 3PAR StoreServ 7400
- 2 x HPE StoreEasy 3000 Gateway Storage
- 2 x HPE BladeSystem c7000
- 36 x HPE ProLiant MicroServer Gen8
- 2 x HPE ProLiant DL380 Gen9 servers
- 2 x HPE StoreEver ESL G3 tape libraries with LTO-6
- HPE StoreFabric SAN infrastructure

“Whether we’ll actually ever need 12,000 slots, I don’t know. But it was important for us to have the ability to expand the HPE StoreEver ESL G3 tape libraries over the coming years should we need to,” explains Reichling. Dr. Reichling never wants to have to remove second copies from the library again just to be able to cope with the backup data volumes, as he had to do in the final months before the new solution was installed.

The HPE StoreEver ESL G3 offers a combination of scalable capacity, high availability and reliability, simple yet effective management technology and enterprise level security so that companies can meet data security and long-term archiving requirements. It can be scaled up to a capacity of 75 PB and is therefore ideal for use in large storage environments.

The Capacity on Demand option enables operators to expand their systems flexibly and without interruption, and also makes it easier to manage storage environments that are constantly growing. The HPE ESL G3 software minimises risk and increases ROI and productivity by monitoring the status of the entire tape storage environment proactively and reliably. The HPE ESL G3 provides high availability by using redundant network components and a dual system which uses automatic path failover in the host systems to ensure the tape systems perform as effectively as possible. Security features such as access controls and FIPS-compliant data encryption are key data management functions, both when writing data to the tapes and after they have been exported.

Higher data volumes faster with LTO-6

Another positive factor for the data centre is that the data volumes and speeds of the LTO-6 tapes are far above those of the previous LTO-4 tapes: “You can really tell how much better the data is compressed – it’s actually improved by a factor of 3.9,” says Reichling. “And as they are faster, we no longer have bottlenecks being created overnight as sometimes used to happen when parallel backup jobs were competing with restore jobs.

“The IT administrators are also very happy that they no longer really have to manage the tape libraries. Once configured, they work perfectly – writing the data to the tapes each night. Restoring data from the tapes is also now a fast and reliable process,” praises Reichling.

Managing the data centre’s storage and server environment is now much easier than it was before. Reichling: “And if something does go wrong, we only have to contact one manufacturer as everything is from HPE. HPE and Bechtel resolve any problems we have quickly and professionally.”

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