

“Our priority is to ensure continuous access to data for researchers. The Fujitsu solution gives us the flexibility we need, making future expansion easy.”

Alberto Ciampa
Head of GRID and Calculation and
Networks Service, National Institute
for Nuclear Physics, INFN Pisa Division

INFN Pisa needed constant data availability. It expanded its storage infrastructure with Fujitsu ETERNUS DX8700 S3, guaranteeing outstanding performance.

At a glance

Country: Italy

Industry: Research

Founded: 1951

Employees: 5000+ people involved in Italy
(around 2,000 employees)

20 divisions, 4 national laboratories

Website: www.infn.it

Challenge

In terms of computing power INFN Pisa runs the second largest installation of the entire network of INFN institutes in Italy. The role of Tier2 institutions in the CMS research project requires a huge amount of data storage capability – easily accessible to the scientific community undertaking the analysis work.

Solution

Beside the ability to manage storage capacity flexibly, the institute is highly dependent on consistent performance to cope with the proliferating amount of data. FUJITSU Storage ETERNUS DX8700 S3 system was installed and integrated into the existing infrastructure.

Benefit

- Scalability of capacity and controllers, to support flexible and unpredictable requirements
- Installation and integration into existing infrastructure completed in a few days
- Fully symmetrical architecture to guarantee performance

Customer

INFN (National Institute for Nuclear Physics) is a public body that promotes and coordinates research into the fundamental constituents of matter and carries out theoretical and experimental activities in the fields of sub nuclear, nuclear and astroparticle physics. The Pisa Division conducts research in close collaboration with various academic institutions in Italy, but mainly works with a number of international institutions equipped with particle accelerators, in particular CERN in Geneva. To analyze data, it has a computation model that is spread over several sites, providing its network of physicists with the computing and physical resources necessary for their work.

Products and services

- FUJITSU Storage ETERNUS DX8700 S3
- On-site technical support during the implementation phase, including tutorials on the operational management of the system
- Guarantee covering the products' excellent reliability

Challenge

The Pisa Division of the National Institute of Nuclear Physics participates in numerous scientific experiments that can involve several thousands of researchers, as is the case with the project involving the CMS particle detector. For this reason, it is necessary to review its IT infrastructure regularly, above all to ensure constant data availability for physicists engaged in the experiments. The relative impossibility of predicting storage requirements in the medium term prompted INFN to look for a more flexible solution than it used in the past.

Solution

Opting for a technological change from its existing infrastructure, INFN Pisa decided to expand its fleet of storage devices with the Fujitsu ETERNUS DX8700 S3 system, which provides the bidirectional scalability that the institute was looking for. According to Alberto Ciampa, Head of the GRID Initiative and the Calculation and Networks Service at INFN Pisa: "The ability to activate new capabilities without the need for a costly redesign is an important added value for us. Fujitsu systems have demonstrated a remarkable capacity for gradual growth, especially in terms of additional controllers." Future capacity expansions can be performed on the same machine.

Benefit

The discovery of the Higgs boson a few years ago, thanks to the largest particle accelerator (LHC) in the world, located in Geneva, has triggered new experiments involving a wide community of researchers in different parts the world, mostly connected via computing infrastructures at universities, which are organized essentially hierarchically. As Enrico Mazzoni, System and Network Manager at INFN Pisa, explains: "The data is produced at so-called Tier0 in Geneva and then sent to sites all over the world that participate in each experiment, which is Tier1, where it is collected, analyzed and stored. We are one of the Tier2 locations, supporting the daily activities of the physicists, ensuring they have continuous access to the data."

INFN Pisa (one of twenty in Italy) is participating in the CMS experiment – a particle detector built with the main purpose of proving the experimental observation of the Higgs boson and other new particles. Nearly 3,000 professionals are working on the project, including physicists, engineers and other specialists. There is a strong Italian component: "In our computing center, we have 1.5 petabytes of disk space dedicated solely the CMS experiment," says Silvia Arezzini, Project Manager at INFN Pisa. "The architectural design must ensure it is possible to meet varying requirements as time goes by, with the capacity to host very large files and provide both serial and random access. Given how Tier2 work is organized, it is not possible to make reliable estimates of disk-space requirements over the medium term, so year-to-year expansions are decided based on past experience."

Taking into account these considerations – but also the fact that the resources are also used for a range of activities including smaller experiments or other research fields, such as Astroparticle Physics, theoretical physics or industrial research – INFN Pisa decided to upgrade its storage infrastructure. In doing so, it started from the view that guaranteed high performance levels needed to be combined with versatility and flexibility in terms of future expansions.

With this in mind, it decided to turn to a totally new supplier – Fujitsu. "After calling a competitive procedure," Ciampa explains, "We opted for the ETERNUS DX8700 S3 given its capacity for gradual expansion, especially in terms of controllers – a feature that we did not find in the offerings of the other competitors we looked at."

Since the project involved a new type of technology, the IT department of the institute had thought it would take time to acquire the necessary knowledge and to integrate it into its existing infrastructure, but as Mazzoni explains: "In the end the experience was extremely positive, because in a few days the machine was installed and operational. Technical support provided efficient help not only in operational terms, but also by adding a training component to help us get familiarized with the new technology. This also allowed us to speed up the integration phase, which we had estimated would take couple of weeks but was actually completed in three days."

The flexibility that led to the selection of the Fujitsu ETERNUS DX8700 S3 will be tested in 2017, when INFN Pisa has scheduled a substantial expansion of available capacity (currently 300 TB on Fujitsu hardware) and therefore also an increase of controllers. However, opinions on the product can already be considered highly positive. So much so that Fujitsu may also be selected for future developments concerning smaller research projects, with new devices or through the activation of software-defined services.

"Fujitsu's solution has enabled us to maintain the level of performance guaranteed to date by our storage infrastructure, while gaining versatility and, ultimately, making cost savings," concludes Alberto Ciampa, Head of the GRID Initiative and Calculation and Networks Service, INFN Pisa Division.

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