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*Ari Lukkarinen
 Development Manager
 CSC – The Finnish IT Center for Science*



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INDUSTRY

Services: IT Support and Storage

SOLUTIONS

Virtualization, Storage Management, Enterprise Platform, Modular Platform
Hardware — Hitachi Universal Storage Platform®, Hitachi Universal Storage Platform VM, Hitachi Adaptable Modular Storage 1000
Software — Hitachi Device Manager and Hitachi Basic Operating System management software, Hitachi Universal Volume Manager and Hitachi Basic Operating System V virtualization software, Hitachi Tiered Storage Manager, Hitachi Dynamic Link Manager
Services — Provided by Hitachi TrueNorth Channel Partner Fujitsu Systems

CSC Builds One of Finland's Largest Storage Environments on Hitachi Technology

CSC, the Finnish IT Center for Science, Ltd., provides storage services for scientific computing and the libraries of all the universities in Finland. The company wanted to get equipped for the accelerating growth of demand by acquiring easily managed and scalable storage capacity. The project was further boosted when the decision was made to store Finland's part of the computing and measuring data of CERN, the European organization for nuclear research, at CSC. The aim was to acquire reliable and flexibly scalable capacity for long-term storage. Hitachi Data Systems supplied the solution.

Administered by the Ministry of Education, CSC is a nonprofit company providing IT support and resources for academia, research institutes and companies: modeling, computing and information services. CSC provides Finland's widest selection of scientific software and databases and Finland's most powerful supercomputing environment, which researchers can use via the Funet network. CSC's services have been at the disposal of scientists since 1971.

The data services unit of CSC offers solutions for demanding data storage, management and processing needs. The services of CSC are particularly suited for customers who need massive storage capacities and long-term storage. The preservation and continuous accessibility of data are ensured through backup and archiving systems.

CSC customers include all the universities, colleges and polytechnics in Finland whose services run in an environment managed by CSC. CSC is responsible for the server and storage environment, which runs the library databases of all the Finnish universities, colleges and polytechnics. In addition, CSC storage capacity is used in connection with the computing services it offers.

In Search of Greater Capacity

In 2006, the 80TB storage capacity of CSC was about to run out. The company knew that the upcoming projects would require considerably larger capacity. To address the storage challenges of the growing masses of data, CSC conducted a competitive bidding process, as a result of which the company started gradually to acquire additional capacity. After assessing the overall options, CSC opted for a

solution provided by Hitachi Data Systems and its Hitachi TrueNorth Channel Partner Fujitsu Services, consisting of Hitachi Universal Storage Platform® and Hitachi Adaptable Modular Storage 1000 systems. In the initial stage, the total capacity of the systems was around 50TB.

"We were initially interested in midrange solutions, but in the competitive bidding process we gave the storage suppliers free rein in terms of creativity and presenting all kinds of solutions. Some of the submitted bids involved systems of a more robust size whose capacity was less costly than we had imagined. We selected the Hitachi solution because, thanks to its scalability and virtualization features, it allows us to prepare ourselves for far into the future," explains Development Manager Ari Lukkarinen of CSC.

Collaboration with Nuclear Physicists Multiplied Capacity Need

CSC's storage needs grew even faster than expected as the Helsinki Institute of Physics (HIP) decided to acquire storage space from CSC for the purposes of the research projects of CERN. In the spring of 2008, CERN decided to launch the Large Hadron Collider (LHC), the world's largest particle accelerator collider complex with the aim to use it for particle tests to produce new information on the basic structure of matter. The massive tests will produce a total of 15 petabytes (PB) of



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Image: Jyrki Hokkanen / CSC

data per year. CERN will decentralize the raw data of computing and pre-processed raw data to data centers located in 11 countries. CSC maintains the Finnish part of it from CERN's Nordic Tier 1 data center. In addition, it is building a Tier 2 data center in collaboration with HIP.

Due to large capacity needs and computational requirements CSC needed reliable and economical disk capacity. CSC tackled this challenge through a solution that consists of the new Hitachi Universal Storage Platform VM and a second Hitachi Adaptable Modular Storage 1000 system. The CERN data is managed using the Universal Storage Platform VM with the storage capacity of the Adaptable Modular Storage 1000 system virtualized behind it.

The capacity of CSC's general purpose storage systems has sextupled to 520TB in two years. Using the Universal Storage Platform VM alone, in excess of 200TB have been virtualized to the Adaptable Modular Storage 1000 systems. In fact, this is globally one of the largest storage solutions ever virtualized through a single device.

The storage system will continue to expand at a fast rate, because the CERN data alone is estimated to increase CSC's capacity need by 170TB per year. Through the Universal Storage Platform VM virtualization, the platform can be expanded flexibly to the point where the capacity of the current Adaptable Modular Storage 1000 is exhausted.

Assets of Virtualization

CSC has been pleased with the new storage platform and its scalability. "The biggest asset of the Hitachi Universal Storage Platform is its virtualization features. Through virtualization, the old systems can also be used for storage capacity. Furthermore, thanks to virtualization, our servers are able to utilize the capacity of third-party storage systems, and we no longer have to worry about the interoperability of the programs," Lukkarinen says.

One of the characteristics of storing CERN data was the need for an exceptionally large LUN size. Universal Storage Platform VM virtualization allowed increasing the LUN size up to 64TB. Lukkarinen adds, "Through virtualization, we reached the required 10TB LUN size as opposed to the regular 2TB."

Simple Environment Eases the Burden on Personnel

According to Lukkarinen, the greatest assets of the new storage environment are simplicity and ease of use. Plus, because of its flexibility, the capacity of the environment can be increased as needed.

"Each piece of equipment, whether small or large, requires two or three people to master it. In fact, it used to be a problem for us to motivate our personnel to learn how to use several small devices. In our current circumstances, with fewer devices, our storage management is considerably more efficient," says Lukkarinen. He adds that CSC is pleased with their collaboration with Hitachi Data Systems and Fujitsu Services. "Maintenance works well and the co-operation runs smoothly on all levels. We aspired to have a partner we can directly turn to in all questions related to data storing. That's what we have with Hitachi," he concludes.

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