ProCurve Networking by HP

Network of Choice

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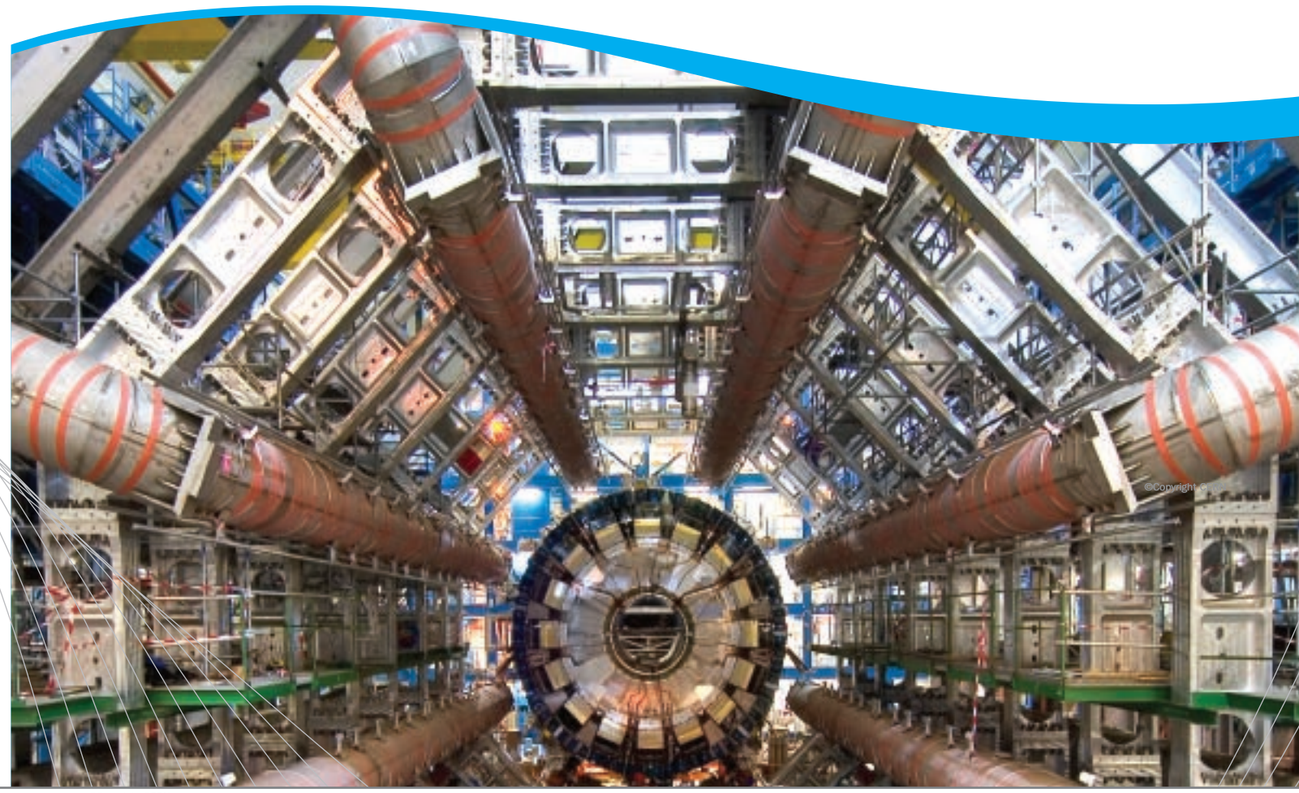

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For more information or to learn more about HP ProCurve Networking visit our Web site at **ProCurve.eu**

ProCurve Networking partners with CERN to unlock the secrets of the universe

◆ For as long as you own the product, with next-business-day advance replacement (available in most countries). The following hardware products and their related family modules have a one-year warranty with extensions available: The ProCurve Routing Switch 9300m Series, ProCurve Switch 8100fl Series, ProCurve Access Control Server 745wl and the ProCurve Network Access Controller 800. Stand-alone software may have a different warranty duration. For details, refer to the ProCurve Software Licence, Warranty and Support booklet at www.procurve.eu/warranty

ProCurve Lifetime Warranty

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CERN (the European Organisation for Nuclear Research), is the world's largest particle physics research laboratory. Founded in 1954, CERN is situated at the foot of the Jura Mountains on the borders between France and Switzerland, northwest of Geneva. Here scientists and researchers operate six particle accelerators that are among the largest scientific instruments ever built. In these devices, elementary particles are accelerated to tremendously high energies and then smashed together. These collisions, recorded by particle detectors, give a glimpse of matter, as it was, moments after the Big Bang.

CERN is funded by 20 member states which are: Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom. India, Israel, Japan, the Russian Federation, the United States of America, Turkey, the European Commission and United Nations Educational, Scientific and Cultural Organisation (UNESCO) have 'Observer' status.

CERN's broad research programme is carried out by some 6,500 visiting researchers from more than 80 nations (which equates to around half of the world's particle physicists) who are supported by 2,500 resident staff. Achievements resulting from CERN's research include the discovery of the W and Z bosons (two fundamental particles of our universe). CERN scientists have also developed a host of detector and accelerator technologies, with spin-offs in areas including medical radiology. In addition to being the recipient of Nobel Prizes in physics, CERN researchers also pioneered the development of the modern Internet: Tim Berners-Lee invented the World Wide Web at CERN in the early 1990s to meet the demand for automatic information sharing between scientists working in different universities and institutes around the world.

"The decision to buy ProCurve was based on the high performance, reliability and low overall cost of ownership that ProCurve's products would bring to our organisation. Ambitious initiatives such as the Large Hadron Collider Computing Grid project, demand technical specifications that are ahead of the industry standard, therefore we like working with vendors such as ProCurve Networking who are flexible enough to invest in developing appropriate solutions."

David Foster, Communication Systems Group Leader,
CERN, Switzerland

Having become operational in September 2008, CERN's Large Hadron Collider (LHC) is a giant particle accelerator and the world's largest scientific instrument. It is housed in a circular underground tunnel, which has a circumference range of 27 km (16.7 miles), 100 m (320 ft) below CERN's site, where particles are already being accelerated at practically the speed of light. Such is the scale of this instrument that the LHC spans the borders of both France and Switzerland. This accelerator will generate vast quantities of computer data, which CERN will stream to laboratories around the world for distributed processing. In February 2006 a trial successfully streamed 1 Gigabit (Gb) per second to seven different sites across the world.

In addition to housing the world's largest and most powerful particle accelerator, CERN also manages the LHC Computing Grid (LCG) project – the world's largest international scientific grid service, which will provide access to shared computer power and data storage capacity over the Internet and dedicated 10 Gb/s links, enabling scientists across the globe to produce, store and analyse an expected 15 Petabytes (1 Pb = 1 million Gb) of data.

Aerial view of CERN

CERN data centre

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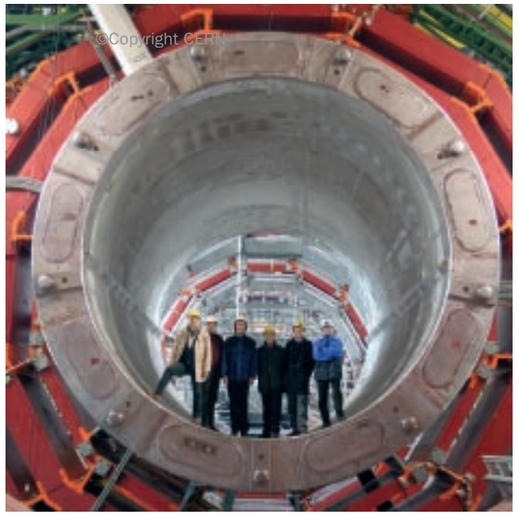


220-ton Solenoid magnet

HP ProCurve 5400zl series switch

OBJECTIVE

Back in 2004, while preparations for the LHC were well underway, CERN's IT department recognised the need to revitalise its IT infrastructure, which had to be capable of managing the data processing power of this ambitious Computing Grid project. The LCG project is essentially a global network of distributed data-processing resources. For this purpose, CERN is in the process of setting up a data centre comprising 6,000 PCs, each of which needs to be connected by reliable, high-performance Gb Local Area Network switches. Although CERN's IT infrastructure had previously coped with the networking demands made of it on a day-to-day basis, it was well aware that it needed to reassess its needs as a result of the heavy demands that the Grid would eventually place on its network environment. Therefore in 2005, CERN invited leading networking vendors to tender for their business. ProCurve won the deal for a number of reasons:

"The decision to buy ProCurve was based on the high performance, reliability and low overall cost of ownership that ProCurve's products would bring to our organisation," explained David Foster, Communication Systems Group Leader at CERN. "Ambitious initiatives such as the Large Hadron Computing Grid project demand technical specifications that are ahead of the industry standard – therefore we like working with vendors such as ProCurve Networking who are flexible enough to invest in developing appropriate solutions. Our campus strategy is to deploy intelligence and increase security at the edge of our network, making ProCurve's Adaptive Edge Architecture™ the ideal strategy for us to adopt."

APPROACH

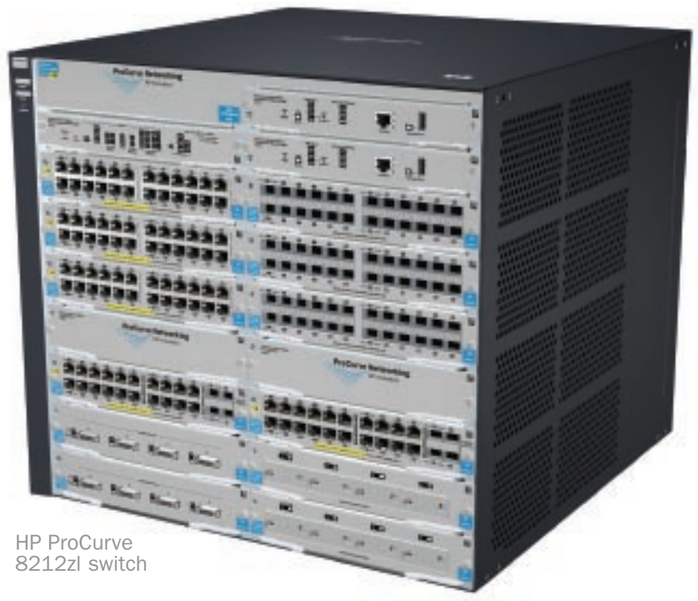
The ProCurve Adaptive EDGE Architecture™ strategy is the industry's only comprehensive and inclusive network design strategy that is adaptable, scalable and completely interoperable for achieving central management, with control to the network edge. The architecture recognises the necessary migration of intelligence and functionality to the network edge.

To date, approximately 940 units of the ProCurve 3400cl switch have been deployed on the CERN site. These switches will bolster the campus network, support individual experiments and enable the 6,000 PCs within CERN's data centre to process and analyse the data produced by the protons and nuclei that are currently being collided at the speed of light in the LHC. More than 1,100 units of ProCurve's award-winning 3500yl switch have also been installed on the site, again with the task of processing and analysing this critical data, which holds the clues as to the origins of the universe. The high-performance 3500 series switches were considered especially well-suited for the LHC's network environment due to their ability to complement the core network.

Additionally, on the campus, CERN has deployed approximately 130 ProCurve 5400 series switches, each equipped with 10 Gb/s uplinks (the 10 Gb/s uplink was a crucial requirement for CERN in terms of its capacity to provide sufficient throughput to the distribution layer).

Finally, CERN has recently installed 10 ProCurve 8212zl core switches on its campus. The 8212 switch is the industry's first core switch with a lifetime warranty enabling wired and wireless networking from the core to the edge, with unified security and management. This core solution was considered by CERN to be ideal in terms of performance, ease-of-use and total cost of ownership (TCO).

HP ProCurve 3500yl series switch



HP ProCurve 8212zl switch

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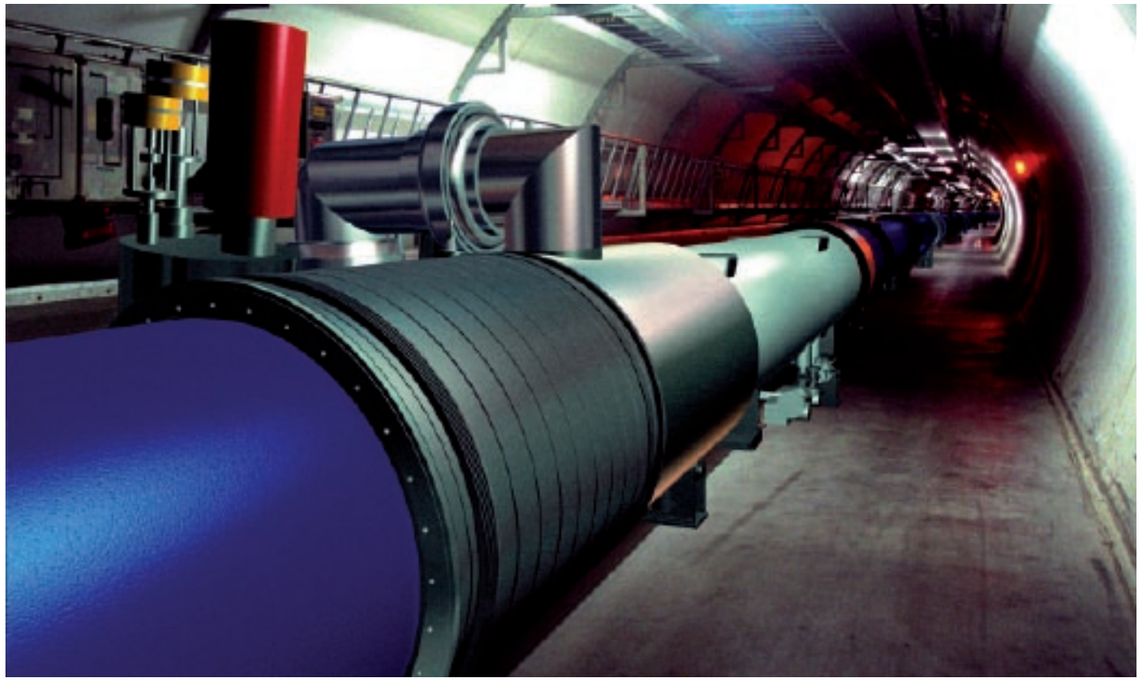
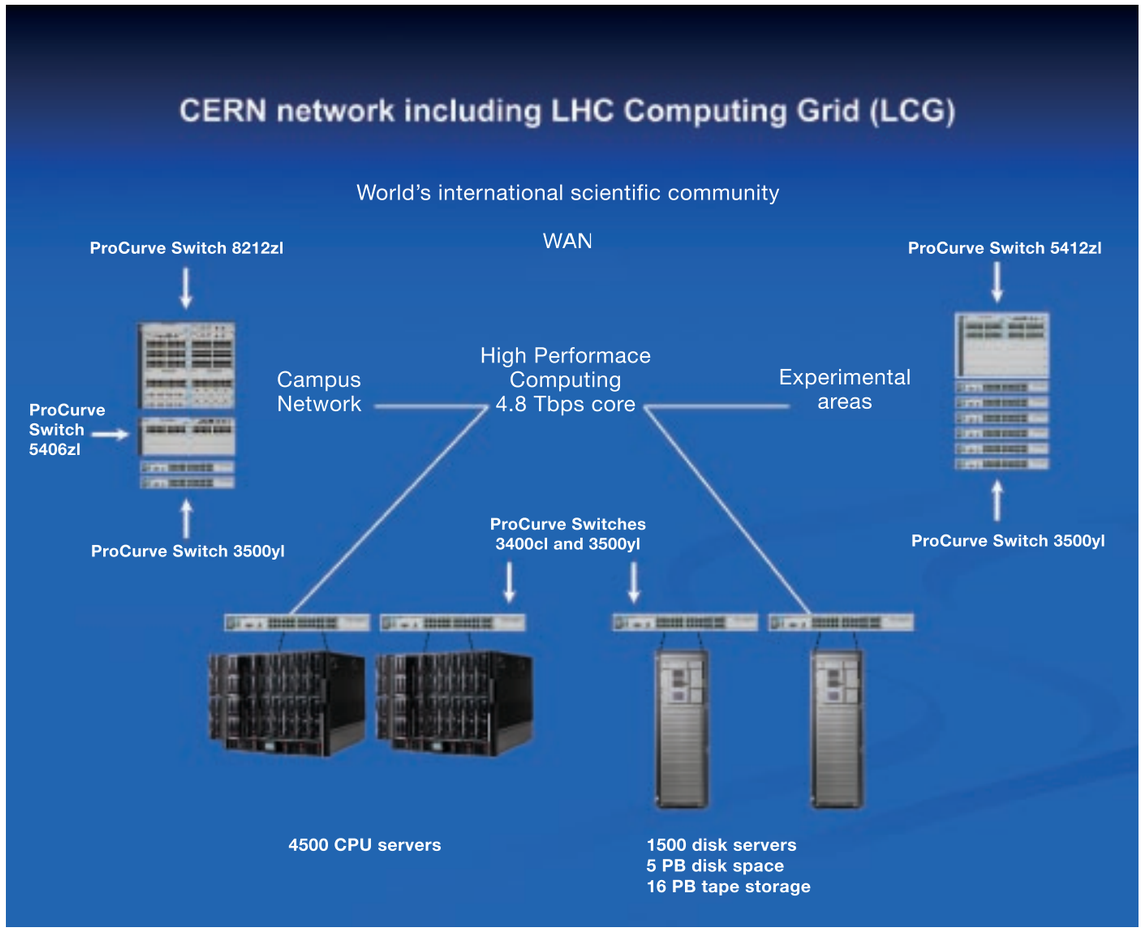
IT IMPROVEMENTS

Like the ProCurve 5400 and 3500 series switches, the 8212 switch is also based on the industry-proven ProCurve ProVision ASIC™. This advanced network processor chip is designed to provide organisations such as CERN with a highly integrated, secure, reliable and high-performance networking platform that meets current and future application needs.

As a leading scientific organisation which demands extremely high levels of performance and security within its IT infrastructure, CERN is continually evaluating innovative technologies to help facilitate its research and productivity. Foster continues: “it was imperative that we chose a solid partner [ProCurve]; one that is dedicated to investing in high-technology and one that is committed to long-term R&D (Research and Development) partnerships.”



The LHC tunnel



BUSINESS BENEFITS

One of the goals of CERN’s LHC is to answer questions about the nature of the 96 per cent of the universe which, astronomical observation tells us, is unaccounted for by ordinary matter. In addition, researchers using the LHC are attempting to determine whether extra dimensions exist, as predicted by various models inspired by the string theory, as well as to identify subtle differences between matter and anti-matter that could account for the dominance of matter in our current universe. It is testimony to ProCurve that it has been identified as CERN’s long-term networking partner of choice. Foster concludes:

“Thanks to ProCurve our network now has the high level of performance, reliability and intelligence required to manage complex applications that are integral to CERN and in particular to the Large Hadron Collider project. We also appreciate ProCurve’s comprehensive Lifetime Warranty◆ and the low total cost of ownership that we are now experiencing. We look forward to a continuing and growing relationship with the ProCurve Networking team.”

Customer at a Glance

Industry sector: Scientific Research
Name: CERN
Headquarters: Geneva, Switzerland
Founded: 1954
Number of employees: 2,500
URL: www.cern.ch

What Makes it Work?

Primary solutions

- Adaptive Network
- Datacenter
- Network Systems & Management

Primary hardware

- 940 ProCurve 3400cl switches
- 1132 ProCurve 3500yl switches
- 130 ProCurve 5400zl series switches
- 10 ProCurve 8212zl switches

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