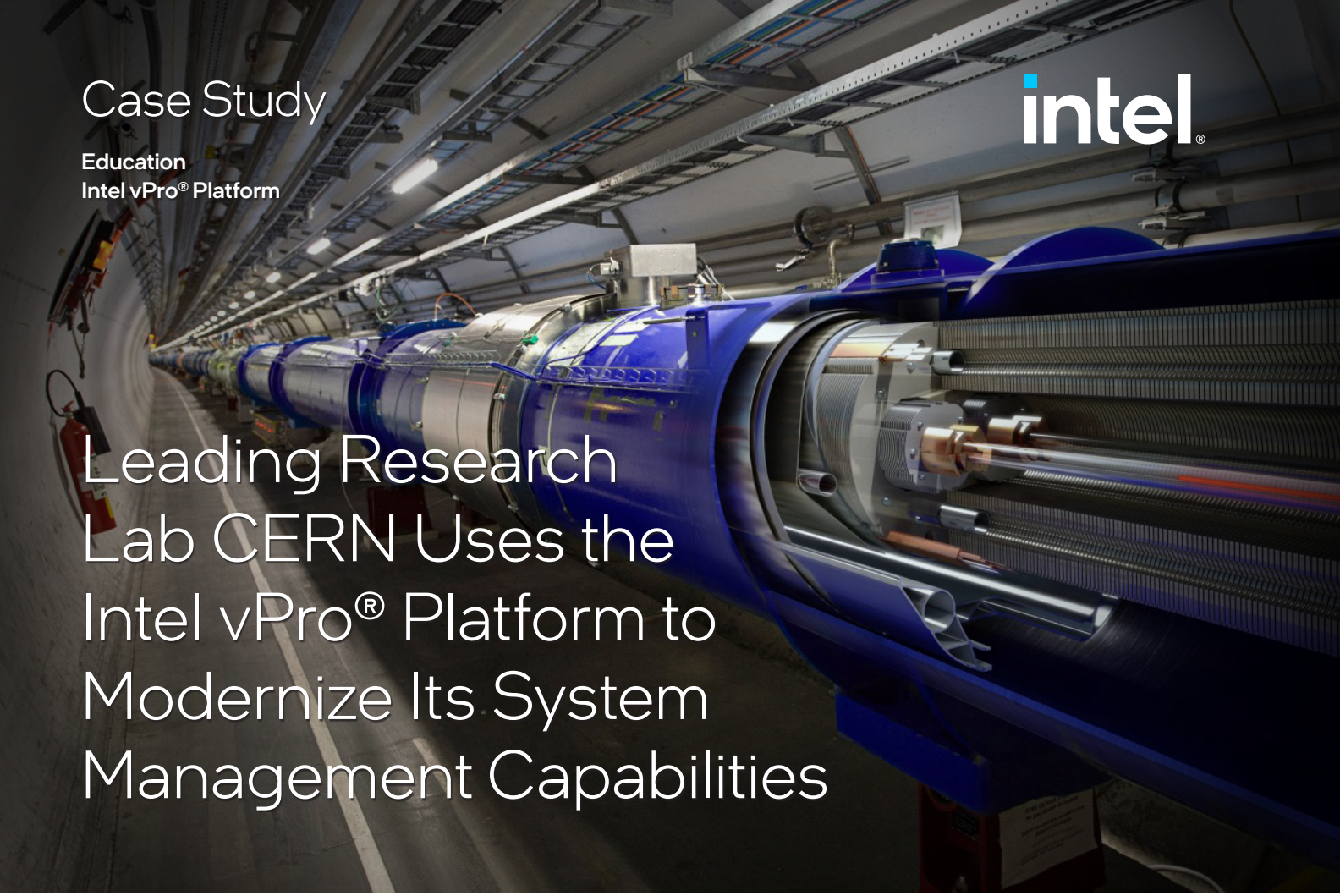
Case Study

Education
Intel vPro® Platform



Leading Research Lab CERN Uses the Intel vPro® Platform to Modernize Its System Management Capabilities

intel vPRO

CERN supplier

Executive Summary

CERN, one of the world's leading research laboratories, used to rely on a host of technologies to control and manage systems inside its main control center and Beams department, as well as its digital signage PC infrastructure. However, that approach created a multiplication of deployed hardware that had to be maintained and was also complicated and clunky to use. After deploying the Intel vPro® Platform to modernize and improve its system management capabilities, CERN's support technicians are now able to restart machines, diagnose issues, and make any repairs needed to CERN's systems, regardless of whether those technicians are working on-site or remotely. This has resulted in a simplified infrastructure for system management, reduced operating and equipment costs, shortened downtimes, and increased time savings. It has also improved the quality of support delivered to the CERN community and CERN's departments.

Introduction

CERN, the European Laboratory for Particle Physics and an intergovernmental organization, is widely recognized as one of the world's leading laboratories for fundamental research about the structure of the universe. At CERN, physicists and engineers use the world's largest and most complex scientific instruments—particle accelerators and detectors—to study the particles and forces that shape the universe.

To support these research activities, CERN has a large campus with 2,500 employees; many external collaborations also take place with different institutes and universities, resulting in 10,000 additional CERN users. As such, there are many people who actively work to secure CERN's LHC operations every day, ranging from Beams generation and control to physical data taking from particle collisions to final data analysis.

Challenge: Updating and Simplifying CERN's System Management Technology

Several years ago, CERN faced a host of challenges, detailed below.

CERN Control Center Support

The CERN Control Center (CCC), CERN's main control room, operates 24/7 and monitors the main LHC accelerator, booster accelerators, and cryogenic infrastructure. The system that CERN's Beams department uses to monitor all these custom engineering infrastructures consists of hundreds of systems based on Intel vPro.

In the past, during the day, CERN had a full team of on-site operators who used a few hundred monitors and 1,000 industrial PCs of different generations to manage and support this infrastructure. However, at night, CERN only had a few on-call operators working from home who had to rely on CERN's small electronics infrastructure to reset, in case of need, the monitoring system and PCs remotely and support any issues that came up. Since that small device infrastructure was complicated and clunky for CERN's operators to use, this approach often resulted in longer downtimes. Plus, it created a multiplication of deployed hardware, which CERN had to regularly update and maintain.

Beams Department Support

Since even a small technical issue can cause major problems for all the LHC experiments taking place at CERN, the Beams department, which is responsible for continuously monitoring and managing the LHC controls accelerator, is a critical group inside CERN.

The Beams department needs to provide full-time support for the monitoring systems that CERN uses 24/7. In 2008, the department started gradually adopting Intel vPro across all the monitoring systems being used inside the CCC and LHC control systems. This technology—which is widely available from most OEMs and fully compliant with CERN's security requirements—allows the department's support staff to take full control of a target device with either an in-band or out-of-band solution, reducing the need for on-site support.

Digital Signage Accessibility: Another Interesting Intel vPro Use Case at CERN

CERN uses 140 devices to manage all its digital signage, which communicates important information to the CERN community inside its campus. These displays also provide people with visibility into the ongoing activities at CERN's campus.

The signage is very often difficult to physically access or requires special registration; for example, one digital sign is located inside a tunnel and has a metallic frame around it. More importantly, in the past, whenever the Windows-based operating system (TBC) on the machine that powered CERN's digital signage crashed, one of CERN's support technicians had to physically restart that machine. CERN and its IT team needed a better way to manage its digital signage so that it could regularly update information and manage the devices regardless of where a digital sign was located.

ORGANIZATION

European Laboratory for Particle Physics

LOCATION

Situated on the French-Swiss border, with its headquarters in Geneva

ANNUAL BUDGET

1.4 Billion (Swiss Franc)

MEMBER STATES

24 Member States; 10 Associate Member States

NUMBER OF EMPLOYEES

2,500 employees; around 10,000 collaborators and contractors

Solution: CERN's Deployment of Intel vPro

To overcome these challenges, CERN knew it needed a better solution—one that would be far more secure and would enable CERN's operators to more effectively and efficiently support CERN's main control center and other departments.

CERN has been implementing the Intel vPro® platform for more than five years now, with ongoing incremental Intel® Active Management Technology (AMT) activations. The CERN Beams department has a couple thousand devices using Intel vPro and upgrades a few hundred of these systems every year. CERN is also using Intel vPro for standard desktop replacements as well as for professional machines for advanced users inside the main CERN control center. Because the Intel solution makes CERN's IT maintenance so much easier, Guillaume Metral, Digital Signage Service Manager, who oversees IT procurement and integration for CERN users, says "using vPro was for me, the best solution."

According to CERN, Intel vPro has been and continues to be a great solution for its needs. Regardless of what system CERN is running—and even if a system has crashed—the support team can quickly and easily gain access to a machine, restart it, diagnose it, and make any necessary repairs to get it properly working again. These capabilities have been "absolutely necessary and indispensable," says Ioan Kozsar, Beams Department Controls Infrastructure Lead, who oversees CERN's control system. Enzo Genuardi, Accelerator Control System Administrator, agrees: "One of the benefits this technology gives us is the ability to launch several scripted tasks on many hosts at once. Then a single administrator can get 600 machines up and running or at least restarted in a few seconds."

CERN's experts say that as the Organization grows, they plan to continue using the Intel vPro platform for their future developments.

Results: Reduced Infrastructure Costs, Improved Support Service

CERN has already seen multiple benefits from using Intel vPro and Intel AMT, including:

- **Reduced operating and equipment costs:** CERN no longer has to own and maintain the multiplication of deployed auxiliary hardware replaced by Intel vPro AMT built-in functionality.
- **Improved quality of support services and shorter downtimes:** With Intel AMT, CERN's operators are now able to quickly and easily control CERN's monitoring and signage systems, including rebooting, adjusting or replacing configuration files, and remediating any issues with the infrastructure—regardless of whether an operator is working on-site or remotely.
- **Time savings:** CERN is now able to get thousands of machines up and running within a few seconds and then launch tasks, perform patch interventions, and apply changes to all those machines simultaneously.

Learn more about Intel vPro at Intel.com/vPro.