

AUTOMATING IT SAVES TIME AND BRINGS BIG RESULTS

CERN, the largest physics lab in the world, realizes a 4x increase in performance with the ability to easily manage its servers remotely day or night.



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Business needs

Running a data acquisition system 24 hours per day requires a solid, dependable hardware with low failure rates. CERN's IT staff is always on call in case of failure, so they need the ability to service from anywhere at any time. Remote intervention and remote management capability are crucial.

Solutions at a glance

- Dell EMC 14G PowerEdge servers
- Dell EMC OpenManage Enterprise
- iDRAC with Lifecycle Controller

Business results

- Improved deployment capabilities from 15 servers per day to 300 servers in 30 minutes
- Decreased energy usage from 20% CPUs to 5%
- 4X performance increase
- Remote capabilities enable IT staff to manage servers from home during off hours

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Ulrich Fuchs
IT Service Manager, ALICE experiment at CERN

The European Organization for Nuclear Research (CERN) operates the largest physics lab in the world. Located in Switzerland, CERN has about 2,000 people with approximately 14,000 visiting physicists conducting research. It currently runs four main experiments on its accelerator, including ALICE ([A Large Ion Collider Experiment](#)).

The ALICE detector sits in a vast cavern 56 m below ground close to the village of St. Genis-Pouilly in France, receiving beams from the Large Hadron Collider (LHC) ring. It is designed to study the physics of a phase of matter called quark-gluon plasma.

Unsurprisingly, the ALICE experiment requires massive amounts of data. Ulrich Fuchs, IT Service Manager for the ALICE experiment at CERN, explains, "The data we get out of the experiment is so huge that we cannot send it over the network, so we really have to treat this data onsite in real time." The data acquisition team is challenged with compressing, filtering and reducing large data streams to a point where they can store it and hand it off for distribution and analysis.

Fuchs continues, "To run a data acquisition system 24 hours a day, 250 days per year, we needed solid hardware with low failure rates and good support."

To meet these specific data management needs, CERN requires a reliable, efficient and secure infrastructure. The IT staff chose Dell EMC PowerEdge servers because they can use the same platform for all the team's tasks. Dell EMC PowerEdge 14G servers provide CERN the performance needed for the high-performance computing infrastructure, which processes millions of gigabytes per year for big data and statistical analysis. The servers also support internal workloads and development machines in the lab. As Fuchs put it, "we have one server platform that covers all our needs."

After implementing PowerEdge 14G servers, the CERN ALICE project experienced a 4x increase in performance. The CPU power consumption and heat decreased from 20% CPU usage to 5%.

CERN also depends on the Dell EMC Systems Management portfolio to simplify their processes. [Dell EMC OpenManage Enterprise](#) and [Dell EMC iDRAC with Lifecycle Controller](#) help CERN automate their infrastructure management, saving time and increasing performance. For example, it previously took one person an entire day to deploy 15 servers, but now that same staff member can deploy 300 servers in just 30 minutes. In addition to the need for top performing hardware, remote manageability is crucial for CERN. The ALICE IT staff is on call 24 hours per day to provide service in case of failure, so they must be able to quickly respond from anywhere at any time of day.

Automating these processes helped free up CERN's IT staff, so they focus on other important tasks such as hardware development and analyzing future AI projects. The remote management gives them the ability to quickly handle situations that occasionally come up in the middle of the night or on a holiday. As Fuchs explains, "we can now power cycle a machine and go back to bed at 4:00am, rather than getting dressed,

"With OpenManage Enterprise, we can now power cycle a machine and go back to bed at 4:00am, rather than getting dressed, getting in the car and driving onsite."

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getting in the car and driving onsite.” He continues, “OpenManage Enterprise gives us very good control of all the PowerEdge servers we have, monitoring of hardware faults which cannot be picked up from a monitoring system running on the host operating system.”

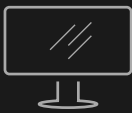
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Dell EMC is a true partner for CERN, and PowerEdge powers their HPC environment. According to Fuchs, “We have almost weekly discussions with our dell team to prepare for coming upgrades and get informed about new products. We give feedback to the HPC development labs to really implement this in future server generations.”

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