Totally Integrated Power (TIP) for data centers

Energy for Germany's largest cloud

In Biere in Saxony-Anhalt, T-Systems has put the first sections of the largest data center in Germany into operation. With the new server farm, the Telekom subsidiary is expanding its capacity for cloud computing. Integrated power distribution equipment (TIP) from Siemens ensures the necessary reliability and maximum energy efficiency both here and in the "twin" data center in Magdeburg.

The cloud has arrived in Germany. More and more people are accessing their digital photos or videos in the cloud using networking rather than storing them on their hard drives, and more and more companies are outsourcing parts of their IT operations to cloud service providers. To address this growth market, Deutsche Telekom, one of the major cloud providers alongside Microsoft, Google, Amazon, and IBM, has significantly expanded its resources. In Biere, a town of 2,000 inhabitants 20 km south of Magdeburg, a new high-performance data center designed specifically for cloud services was officially inaugurated on July 3 in the presence of Telekom CEO Tim Höttges and the German Minister for Economic Affairs and Energy, Sigmar Gabriel. When completed, it will be the largest data center in Germany, with an IT area of 36,000 m^2 and a maximum power consumption of 72 MW.

"High-tech Fort Knox"

Because data protection and fail-safe operation are of the highest priority for Telekom's cloud customers, Biere will form a "TwinCore" together with the existing data center in Magdeburg – a twin data center where the data are held in parallel, allowing it to step in immediately in case of failure. A continuous and secure power supply at both "twins" is ensured by power distribution systems from Siemens that are specifically designed to meet the high demands of data centers. In these server farms, a power interruption of more than 10 ms can already lead to massive disturbances. The threat is posed not only to the servers themselves but also to the air-conditioning systems. Because of the increasing compactness of data centers, the waste heat concentration in a small space is growing, which can quickly lead to overheating of chips and components if the cooling system fails.

Integrated planning with Simaris and Sincal

Thus, the electrical power distribution for the infrastructure needs to be planned in a fail-safe manner. In Biere,

An aisle with servers in Deutsche Telekom's new high-performance computing center in Biere

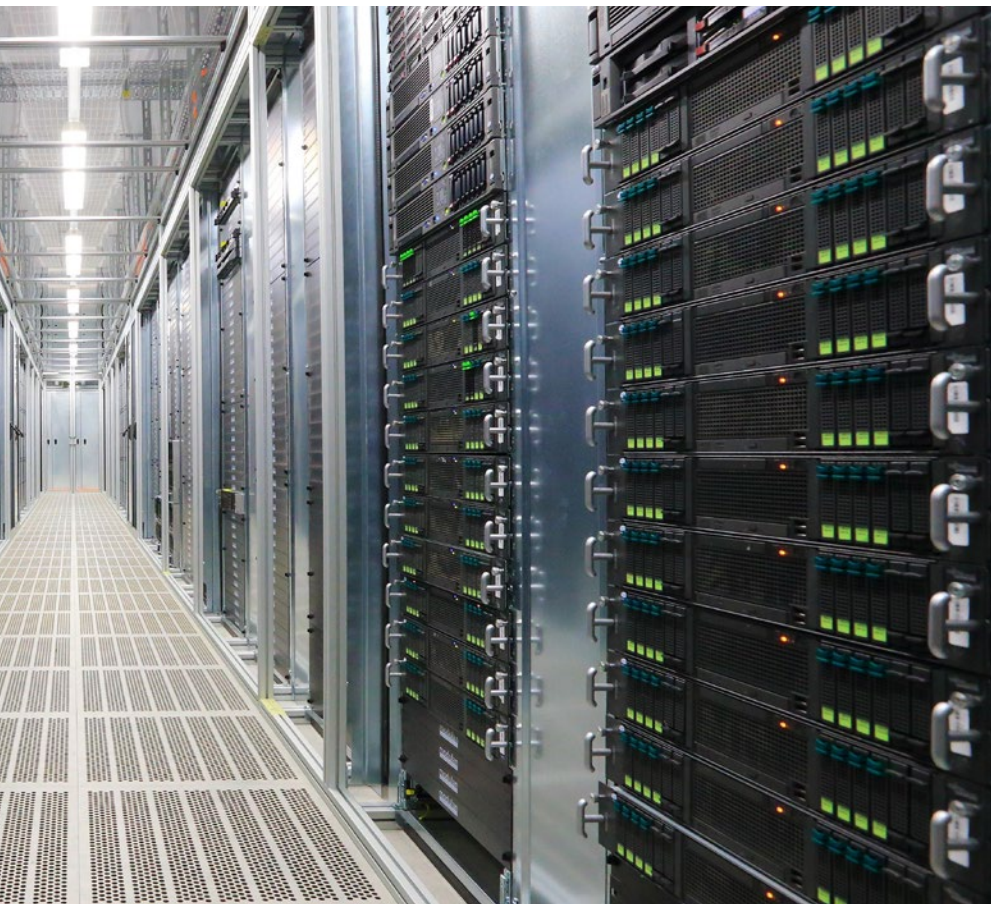
picture alliance / dpa / Jens Wolf

the responsible plant engineering company M+W Group used the Siemens Simaris and Sincal planning tools. This allowed the power supply to the individual systems – air-conditioning and cooling technology, lighting, fire protection, safety technology, and control systems – to be closely coordinated. The electrical equipment was sized and selected so that it is optimized not individually but collectively. All the components were sufficiently dimensioned for loads in operation at rated value as well as in the case of disruptive incidents. With the use of Totally Integrated Power (TIP) components from Siemens, the project team made the system future-proof. While the technical development of servers and routers, for example, demands that technically obsolete equipment be replaced after four to five years, the components of the electrical power distribution system are designed for a service life of 20 to 40 years – which Siemens guarantees through appropriate service and comprehensive technical upgrades.

Maximum energy efficiency with a PUE of 1.3

Data centers are intensive energy consumers. This is due not only to their energy-hungry servers but also to the building management systems. For example, some data centers require half of their electrical power for cooling alone. Energy costs thus account for the lion's share of operating costs, making it even more important to design the infrastructure so that it is as energy-efficient as possible. Biere sets standards here. With a power usage effectiveness (PUE) of 1.3 – the industry uses this value to refer to the ratio of energy used to the energy consumed by the servers – it ranks among the most modern and energy-efficient in its class (the industry average is 1.8). ■

Deutsche Telekom AG



TIP in Biere

- 30-kV gas-insulated medium-voltage switchgear of type NXPLUS (8 fields)
- 20/10-kV gas-insulated medium-voltage switchgear of type NXPLUS C (78 fields), including protection technology
- 18 Geafol transformers (2,500 kVA each)
- Sivacon 8PS busbar trunking system
- Sivacon S8 low-voltage power distribution board (540 fields)
- Siemens Simaris and Sincal planning tools

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Download the "Applications for Electrical Power Distribution – Data Centers" planning handbook at siemens.com/tip-cs/planningmanuals