Stadtwerke Wolfsburg (Germany) and its telecommunications subsidiary Wobcom have built a high-availability data center in the heart of the city for new digital infrastructure. The IT cabinets are even equipped with multiple sensors to meet the availability requirements. Central monitoring facilitates maintenance and resource management.

WOLFSBURG
ON THE ROAD TO BECOMING A SMART CITY

DIGITIZATION STRATEGY

In cooperation with Volkswagen, the city of Wolfsburg has developed a digitization strategy. Wolfsburg has set for itself the goal of becoming a pioneer in electromobility. In addition, new business areas will be created for companies in the IT field. Stadtwerke Wolfsburg and its subsidiary Wobcom are responsible for setting up a broadband network and for creating an open digital platform. On this platform, initiatives, offers, and projects will be created based on the network of data from all fields of the city.

FROM FIBER TO WLAN

According to Dr. Frank Kästner (CEO of Stadtwerke Wolfsburg), all 80,000 households in the Wolfsburg area should be equipped with fiber optics by 2021. In addition, a nationwide WLAN will be created. According to Dalibor Dreznjak (head of corporate development at Stadtwerke Wolfsburg), it should become a public WLAN that can also be used, for example, for autonomous driving.

THE CORE OF THE NEW NETWORK

The core of the infrastructure is the Wobcom data center in the Nordkopf Tower in the center of Wolfsburg. That is where the Internet hub for the region is located with a fast connection to other Internet nodes and various networks. The expansion of the broadband network will also create numerous small edge data centers distributed throughout the city. These data centers are required for fast data processing in 5G mobile transmissions and, in particular, autonomous driving. Additionally, the new central data center is connected to another data center in the city owned by Stadtwerke.

FIVE FLOORS

The new data center serves as a core for the broadband network, accommodates regional cloud solutions, and provides hosting and colocation services to individuals, companies, and local government agencies. The data center extends across five floors in the core of the Nordkopf Tower. In fact, the building is home to five independent data centers that allow for high redundancy and provide sufficient space for hosting customers. These data centers went live in the spring of 2018 and correspond to Tier 3 requirements and the highest category D according to the Bitkom Guide for Reliable Data Centers.

CABINET MONITORING

To achieve maximum reliability, Wobcom Enterprise Architect Giovanni Coppa designed each IT cabinet redundantly and PDUs are used to monitor the connected components for power consumption. Coppa chose Raritan's PX5000 Intelligent Rack PDUs because they provide additional sensor ports to which environmental sensors can connect. Each cabinet in the Nordkopf Tower now contains two PDUs powered by different circuits. Two combined temperature/humidity sensors are connected to each cabinet, and the cabinets are equipped with a door lock with access control.

SAVING ENERGY

The monitoring of electricity consumption enables an energy-saving operation and a detailed analysis of consumers in the data center. This makes it easy to see when and which components are causing utilization peaks. This enables a targeted and more-effective distribution of the hardware in the data center. Power and voltage measurements can also increase availability. In order to detect faults early, additional measuring points at the input and the circuit breakers are therefore useful.

TEMPERATURE AND HUMIDITY

Active components must comply with the temperature and humidity requirements. For that reason, the temperature should be measured directly at the server rack. The requirements for relative humidity are also high in the data center and subject to tight tolerances. Too much air can lead to electrostatic charge and too much humidity can lead to corrosion on the installed equipment. The measurement of the air humidity should be carried out on the supply air, even before it goes through the cabinet. Wobcom works with hot- and cold-aisle enclosures and measures both at the front and in the back of the cabinet with combined temperature and humidity sensors. These measurement points can be used for climate management based on the recommendations of the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE). The PowerIQ software supports this evaluation of the climate data.

MODULAR AND EASY TO EXPAND

An administrator can remotely access, control, and read out the measurement data from their workstation in the Operations Center. This is done via LAN with the monitoring solution PowerIQ from Sunbird Software. The administrator also has the ability to enter upper and lower limits and temperature and humidity thresholds, as well as to set a role-based alert if the temperature or humidity exceeds or falls below these limits. For Giovanni Coppa, it was important for the solution to be "consistently modular and easy to expand."

SUPPORT

The installed hardware can now be clearly documented with the monitoring solution and monitored in detail. This facilitates system maintenance: faults can be identified more quickly and effectively by the operator. Maintenance measures are possible during operation. On-site PDUs with their easy-to-read LCD displays provide a quick overview of the connected components and the associated measured values. Because all of the devices, including the sensors, are connected directly to the two PDUs, the wiring remains clear. This also makes maintenance easier.

CONCLUSION

As Coppa explains, "The solution meets our exact requirements and allows us to extend the data center operations with facility management in an intuitive way." He likes the fact that the PDUs have so many sensors and modules and that they offer a variety of interfaces. The PowerIQ monitoring solution can also be modularly expanded into a comprehensive DCIM solution. "This enables us to use the PX5000 PDUs with the sensors outside of the data center and to remain fully compatible." In the medium term, the plan is to equip the other data center with this solution, as well. In addition, Coppa wants to attach differential air pressure sensors in the cold aisles to monitor the air flow there. In this way, it is once again ensured that the sensitive components actually receive sufficient cooling. ■

CUSTOMER*CASE*

BENEFIT FROM **EXPERTISE!**

Driven by factors such as the cloud, data growth, and IT cost reduction, the role of data centers is changing rapidly. This creates new challenges when it comes to the design and build to future-proof the data center infrastructure.

We believe that modularity and total integration of the infrastructure's components is key to addressing these challenges. Only then can the right level of flexibility and efficiency be obtained to ensure a consistent optimal performance throughout the infrastructure's life span and at the lowest possible cost of ownership.

To share our accumulated data center knowledge with customers, our experts have published a variety of white papers on various topics.

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