World Wide Technology Relies on Vertiv™ Rack Power Distribution Units for AI in Advanced Technology Center

A Vertiv Case Study

Background

World Wide Technology (WWT) helps its clients and partners conceptualize, test, and validate innovative technology solutions through its Advanced Technology Center (ATC). The ATC offers a range of capabilities, including serving as a proving ground for testing and developing AI solutions. At the heart of the ATC is a data center comprised of more than 500 racks, which showcases emerging technologies, hosts client test labs, and supports technical proof of concepts. The data center also allows clients to experience product demonstrations and testing scenarios focused on integrated information technology (IT) and operational technology (OT) solutions.

One area of particular interest to WWT clients today is the impact of AI compute on data center infrastructure. Clients with questions about preparing their data center to support AI are often directed to Geoff Hubbard, senior manager of data center operations at WWT's ATC.

World Wide Technology

Company Profile

A global technology solutions provider leading the AI and digital revolution by enabling accelerated digital transformation for large public and private organizations around the world.

Industry

Information, Technology and Communication (ICT)

Region

Americas

Challenge

"As our clients prepare to support AI and other high-density applications, their biggest OT concern is power, followed closely by cooling," Hubbard said. "From switchgear to the rack, AI can overload capacities across the power stack."

IT and OT converge in the rack, making effective rack power management essential to IT scalability, reliability and manageability.

"Legacy rack power distribution units (rPDUs) typically don't have the capacity to support the requirements of servers designed for AI," Hubbard said. "High-density AI racks also require more attention to cable management, airflow, and power monitoring, all of which are enabled by well-designed rPDUs."

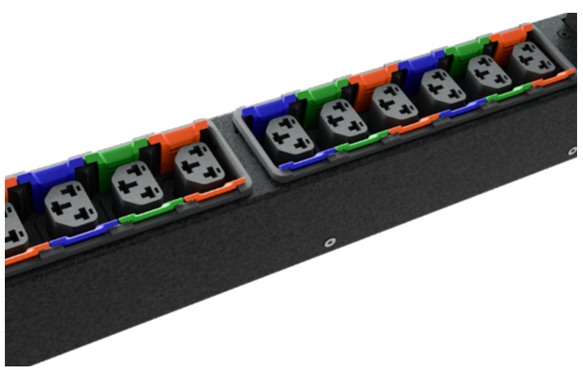
As a result, there is a need for data center operators preparing for AI, or planning to support AI in the future, to implement rPDUs with the capacity, reliability, and functionality that AI compute requires.

Solution

WWT uses Vertiv™ rPDUs to support a broad range of equipment within its ATC data center, including AI-ready Dell XE9680 servers using NVIDIA H100 graphics processing units (GPUs), and Cisco X series high-performance network infrastructure.

"The Vertiv rPDUs have the capacity we need to support the most advanced IT systems in our data center and have a number of features that make OT easier," Hubbard said.

The typical configuration is two rPDUs per rack with each fed from different power sources and sized to support the full equipment load in the event of a failure in either feed. However, Hubbard noted that some AI servers in the data center have six power supplies, and require four to run at peak performance, necessitating more rPDUs per rack to maintain redundancy.



Receptacles on the Vertiv rPDUs are color coded by phase to simplify load balancing.

The Vertiv rPDUs feature color-coded, alternating-phase receptacles for simple load balancing and combination outlets that allow every receptacle to connect to equipment with C13 or C19 plugs.

The Vertiv rPDUs at WWT provide receptacle-level power monitoring and connect to WWT's monitoring platform to provide visibility into device-level power consumption while helping to protect against overloading. Alerts are provided to the management team through text, email, or Slack if power at any receptacle approaches predefined thresholds.

Vertiv rPDUs also feature a pivoting connector that can match to different facility-side cables, from 16 to 60 amps and from 120 to 415 volts, allowing rPDU standardization across multiple data centers in different regions or within a facility with a hybrid power architecture.

"I tell clients that 415V power is how they are going to get to the densities required by AI, and they should start planning for that now," Hubbard said. "These rPDUs are ideal for operators considering moving to 415V for the entire facility or adding 415V distribution to one section of the data center."

Vertiv rPDUs are available with selectable input power configuration and a detachable facility-side cable to enable standardization across multiple data centers in different regions or within a data center with a hybrid power architecture.

Results

"Based on their performance in our data center, we feel very confident recommending the Vertiv rPDUs to our clients," Hubbard said. "When clients ask about rPDUs, I emphasize the value of combination outlets, the necessity of preparing for 415V distribution, and the importance of monitoring. Vertiv delivers all those capabilities in a well-designed, high-quality rPDU that has proven reliable in our operation."

Power distribution redefined: Smart, simple, and flexible

1. **Simplified cable management and load balancing**
   Rack configuration and cable management are simplified by the color-coded, alternating-phase receptacles on the Vertiv rPDUs. "The alt phase color coding allows you to work from top to bottom to keep cable management clean while ensuring proper load balancing," Hubbard said.

2. **Support for high-power servers**
   With the ability to support different power inputs and the use of combination outlets, Vertiv rPDUs are designed to handle the higher power requirements of AI servers.

   > "All of the outlets on our Vertiv rPDUs are combination outlets," Hubbard said. "As an operations manager, it's hard to overstate how much of a game changer the combo outlets are and how much easier they make life in the data center. As we move gear in and out of the data center, we know we'll have the right power outlet for anything we put in the rack. And the high-retention receptacles really grip the plug to prevent accidental disconnects."

3. **Visibility into rack and device power**
   The receptacle-level power monitoring on the Vertiv rPDUs provides WWT with needed visibility into power consumption within the rack.

   > "In a production environment, we want to make sure we are not exceeding any thresholds at the rPDU level or the rPDU breaker level," Hubbard said. "This is especially critical when supporting high-power AI servers."

4. **Operating flexibility**
   With their combination outlets and universal power configuration, Vertiv rPDUs simplify equipment changes within the ATC data center. The rPDUs also feature hot swappable controllers to enable users to install the intelligence they need today with the option to upgrade as their requirements change.

   > "With Vertiv rPDUs we have the reliability, capacity, and operating flexibility needed to manage changing power requirements within the rack," Hubbard said. "Plus, Vertiv offers a portfolio of products that extend across the power stack and work together to give facility managers what they need to run the higher loads that AI brings."

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