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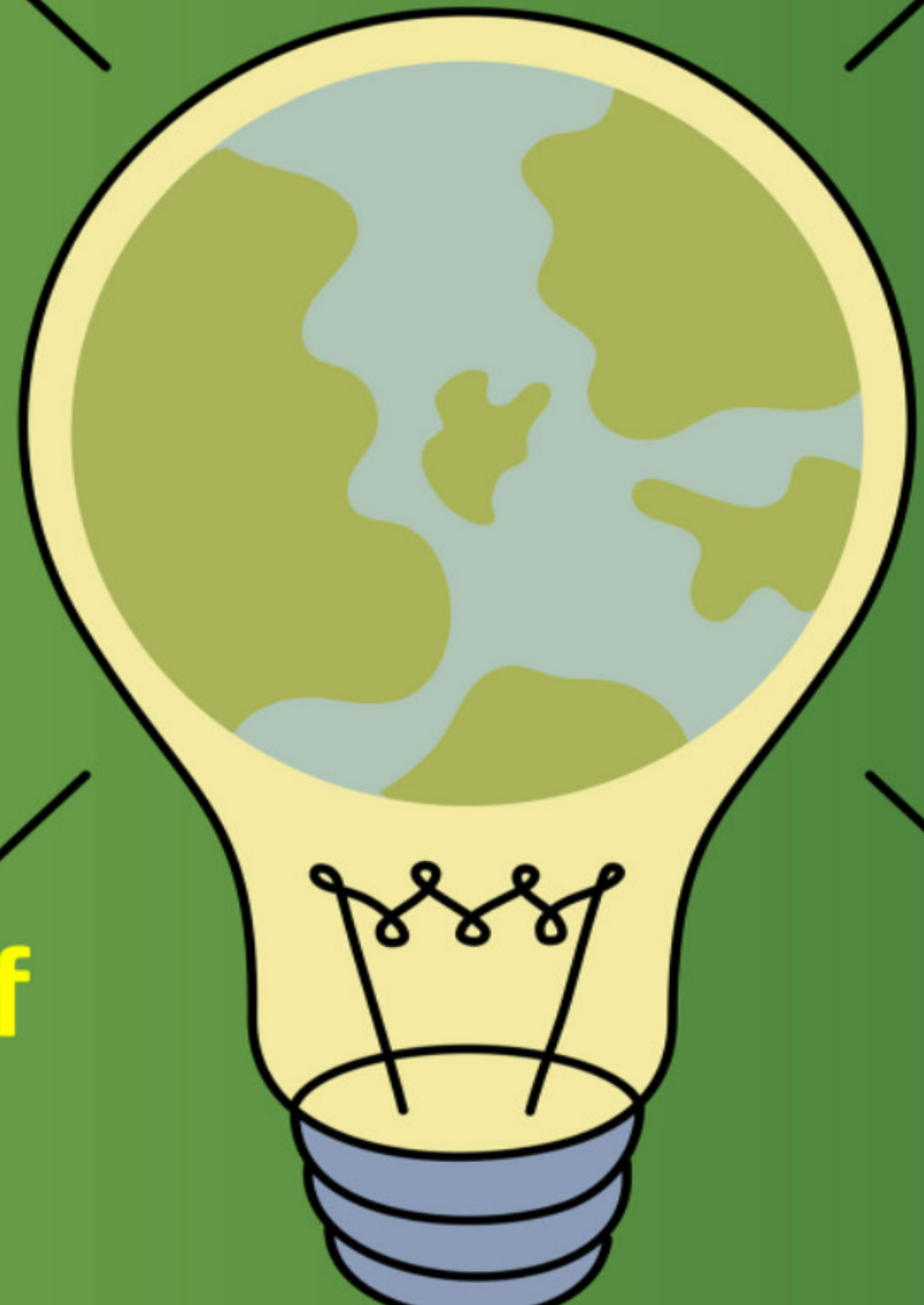
THE ROLE MANUFACTURERS PLAY IN ENABLING A GREEN APPROACH TO DIGITAL TRANSFORMATION

No strings attached

THE INTERPLAY BETWEEN WIRELESS TECHNOLOGY AND SMART BUILDINGS

Taking care of business

PREVENTING DATA CENTRE DOWNTIME AND MAXIMISING OPERATIONAL CONTINUITY



You can't manage what you can't measure

Jon Barker of Chatsworth Products (CPI) explains why effective power monitoring requires the integration of intelligent power distribution units (PDUs) and data centre infrastructure management (DCIM) software

▶ As data centre managers and operators work to keep pace with rising compute demand around the world, and with rack densities within the data centre increasing to an average of 8-10kW, power distribution into the cabinet or rack now requires a more robust PDU alongside more stringent monitoring and measurement for efficient power management.

MONITOR AND MANAGE

Rackmount PDUs are an established solution for distributing power into equipment racks. And in today's remote working reality, intelligent PDUs with monitoring and switching capabilities have become essential. Additionally, advanced power hungry equipment now requires robust PDU functionalities that allow monitoring and control of power down to the outlet level, helping IT professionals



maximise efficiency. In fact, PDUs can be used in high density cabinets full of 1U or 2U rack servers, a few server chassis or networking switches.

As rack density exceeds 8kW, the ideal scenario is now to distribute three-phase power to racks and reduce the number of PDUs needed to power equipment. Powering equipment evenly across the three power phases, also known as load balancing, has become even more critical as higher data demand results in greater reliance on the resources needed to support today's 'always on' world.

By extending power monitoring closer to the equipment, a data centre operator can acquire more precise information on power demands at either the rack level or input

level. It is therefore recommended that IT professionals follow a two pronged strategy that includes the integration of intelligent PDUs and DCIM software.

INTELLIGENT DESIGN

Power management in the white space, particularly inside a cabinet, is critical to ensure availability of all IT applications, as well as to minimise the overall energy footprint of the data centre.

Additionally, with efficient power management it is possible to boost operational efficiency by managing and monitoring power at the rack and device level. Here are a few recommended best practices for achieving this:

• Equipment utilisation

Monitoring of voltage, power and current down to the outlet level provides visibility into the total power consumption for each piece of IT equipment, so data centre managers can see exactly from where power is being drawn.

• Understand the operating conditions of equipment

Hotspots within cabinets are a common cause of equipment downtime. Temperature levels within the white space have a strong correlation to overall energy consumption within the data centre. Having the ability to measure and track inlet and outlet temperature levels at the

rack level can help identify servers running ineffectively, aiding load balance and keeping costs in line.

• Get real time results

It is important to be able to quickly identify an issue when it arises within a server cabinet or rack.

• Minimise power consumption

Remote outlet control allows unused outlets to be turned off and power to be cycled to hung equipment to better manage at rack level. There are several types of relays used within PDUs to control outlet state. Bi-stable latching relays recycle power to outlets, helping to maintain PDU efficiency levels. They also allow outlets to maintain state after a power event, while ensuring basic power distribution to an outlet is not compromised.

• Ensure enterprise authentication and secure communication

It is hard to protect data from being compromised if you simply don't know where to put the protective prevention measures in place.

EVALUATING DCIM

DCIM software provides an easy way to aggregate sensor measurements, power consumption, environmental monitoring and security management, as well as visualise data over a room floorplan in trendlines and reports. This makes it easier to report on rack power usage by device, rack, row, bay, room, site or even to recognise the correlations between system events.

Once intelligent PDUs that monitor power at the outlet level are in place, it is beneficial to centralise monitoring and

automate reporting with DCIM software too. Be sure to consider a DCIM software solution that centrally manages and controls PDUs and intelligent assets, monitors overall health and offers:

- **Active power by month and device**

Use data to prevent power issues and maximise uptime. Also identify power consumption by server.

- **Data charting**

By visualising trends and occurrences, you can identify problems and optimise site capacity utilisation and security.

- **Power capacity trends and analysis**

Monitoring trending power capacity over time can help forecast power consumption more accurately.

- **Power charge back reporting**

Control consumption expenses with DCIM software that unifies equipment data in a simple report.

- **Failover testing**

Test failover capability without having to shut down the power chain. Select a solution that proactively provides information to confirm whether or not



failover capability within any cabinet is being compromised.

- **Searchable database and easy integration**

DCIM software provides excellent preconfigured dashboard and reporting tools, but access to the data that DCIM software collects and stores is also important. Additional insights are possible when combining data from the facility (DCIM) with data from the network and servers, or from other asset management tools.

Basic DCIM software should provide power monitoring and management, environmental management, capture and storage of data, monitor and alarm thresholds, trend power and environmental conditions, simplify administration of user access rights and log each access attempt. It should also provide more robust asset management, power chain and connectivity mapping, as well as change and workflow management.

PLAN OF ACTION

Outside of primary data centres, there is a growing need to place more compute on enterprise sites. As sensor costs come down, the use of the internet of things (IoT) to capture data to improvise operations is increasing. Enterprises will need to evaluate if they will send local data to the cloud or process it locally.

In many instances the cost of processing data locally makes sense, creating the need to place compute back into enterprise

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sites. Here, the use of rackmount uninterruptible power supplies (UPS) is ideal. And newer battery technologies like Lithium-ion may be a good choice. Although more expensive than traditional lead acid solutions, these batteries will often provide longer life battery power, recharge faster and need less maintenance.

POWER RANGER

There are three complementary technologies that impact UPS selection – Wi-Fi 6, 5G and 60W-100W power over Ethernet (PoE). Both Wi-Fi 6 and 5G radios require

higher power and future generations will also further drive the need for upgrades in PoE. Upgrades in PoE require review of the UPS to ensure battery power for critical systems in the event of a power outage. Furthermore, now that 60W PoE is standards based, there are more end devices that can be powered over Ethernet, including building systems for lights and displays.

Finally, the racks that hold all this equipment are often an afterthought. But as rack densities increase, so do the loads within the racks. The combined weight of equipment and UPS is increasing. In fact, new designs have increased load capacities well above 1000kg per rack. Along with rack density, the weight of equipment is increasing with the average 2U, four socket server weighing around 36kg, and the average 2U UPS weighing around 60kg.

STRATEGIC DECISION

Ultimately, a solid power management strategy that takes into consideration the

many practices, pitfalls and possibilities shared here should help ensure that data centre managers and operators are better prepared to face the constantly evolving future of technology and the demands that come from it. The work starts now. ■



JON BARKER

Jon Barker is CPI's technical manager for Europe. He has over 25 years' experience in the engineering industry, with 15 years specialising in data centre infrastructure. As technical manager, Barker serves as a technical contact, accountable for resolving pre- and post-sales support questions and issues, and provides support to CPI's sales team by delivering product and technology based presentations to customers, channel partners and industry event audiences.