

Increasing Uptime and Efficiency with Switched PDUs

Two ways to use rack PDUs for more than just distributing power

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Power distribution units (PDUs) play an essential role in delivering power safely and at appropriate voltages to servers and other network resources. A particular class of power distribution units known as rack Switched PDUs, however, is capable of performing additional functions that can help data center managers improve the efficiency and reliability of their IT infrastructure. This paper provides a brief introduction to rack Switched PDUs and describes two underappreciated yet powerful ways to take advantage of their advanced functionality.

What is a rack Switched PDU?

Typical floor-standing PDUs provide upstream electrical power to multiple downstream infrastructure devices while simultaneously lowering current and voltage to usable levels and protecting against dangerous electrical spikes. Rack switched PDUs perform those same functions, but also enable data center managers to monitor and control individual power outlets remotely over the network. This capability can help companies reduce downtime and save money in several ways.

What is load segmentation?

Many UPSs and PDUs allow data center managers to manage different groups of power outlets—called load segments—independently of one another, either manually or automatically based on pre-programmed instructions.

Why do I need it?

UPSs are designed to provide a few critical minutes of emergency backup power during electrical outages, time that data center managers can use to prevent data loss or corruption by shutting down servers gracefully. Organizations can extend the amount of emergency power their UPS hardware provides by assigning mission-critical infrastructure to one set of load segments and less important devices to others. Then, during a power loss, they can quickly shut off lower-priority load segments first, leaving more battery capacity for segments that need longer protection.



Figure 1: Switched PDUs enable organizations to define as many load segments as they require.

How can rack Switched PDUs help with load segmentation?

Many single-phase UPSs group their power receptacles into just two load segments. That's often too few even for applications requiring only one or two racks of IT equipment. Data center managers can overcome that limitation, however, by plugging hardware into a rack Switched PDU which they then connect into a UPS. Leveraging the Switched PDU's outlet-level management functionality, they can then define and administer as many load segments as they require, up to the total number of outlets available.

What is a remote hard reboot?

When a server becomes unresponsive and software-based efforts to fix it prove unsuccessful, data center managers usually unplug the device or switch off the power as a last resort. That procedure is known as a "hard reboot." In a remote hard reboot, data center managers cycle the power to a server off and then back on again over the network, using power management software and a Switched PDU.

How does it help me?

In IT, as in so many other service professions, time is money. The longer a server remains down, the more your company's revenues, response times and productivity are likely to suffer. Executing a remote hard reboot is a far quicker way to get "frozen" hardware up and running again, rather than sending a data center manager to perform the task manually.

Moreover, tight budgets have most businesses struggling to get more done with less money and fewer people. Yet physically dispatching data center managers to malfunctioning servers is a time-consuming, and therefore costly, activity. This is especially true at companies that have servers at branch offices and other offsite locations or that operate data centers in multiple locations. In such cases, sending someone to address a problem often involves investing time and money in a car trip or even plane ride. Organizations equipped to conduct remote hard reboots spare themselves that needless and wasteful expense.

How can rack Switched PDUs help with remote hard reboots?

Together with power management software, rack Switched PDUs are what make remote hard reboots possible. By providing secure, individual control over power outlets via a central console, Switched PDUs enable authorized data center managers to turn specific devices off and on again remotely over the network. They also arm data center managers to temporarily disable outlets supporting idle servers. As a result, Switched PDUs can reduce energy bills by eliminating the so-called “vampire” power draw most electronic devices produce when they’re plugged in but not being used. For more information on this topic, read [Eaton’s Power Monitoring 101 white paper](#).

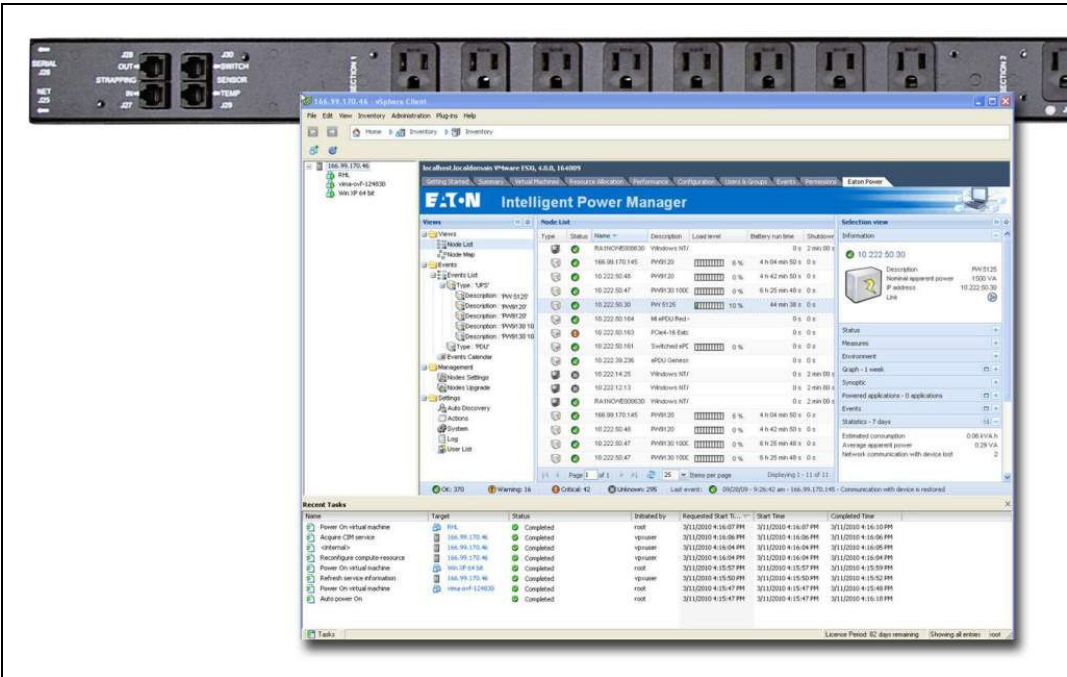


Figure 2: Together with power management software, rack Switched PDUs enable data center managers to control power outlets individually via a central console.

In addition, Switched PDUs make enforcing disciplined data center operational processes easier. Data center managers can disable unused outlets until appropriate permissions have been issued. That way, no one can inadvertently overburden the power system by plugging in unapproved and unanticipated loads.

Conclusion

PDUs have long been a familiar part of the data center landscape. However, the outlet-level control that rack Switched PDUs provide can help organizations preserve uptime and save money in often underutilized ways, such as increasing the granularity of their load segmentation and rebooting unresponsive servers remotely. These and other benefits help explain why Switched PDUs are an investment most companies would be wise to investigate.

About Eaton

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About the author

Gene Keifer is the ePDU Business Manager for Eaton's Distributed Power Solutions group. Gene has more than 20 years of experience within the electrical industry, working in sales, product management, customer support, and operations for industrial control, power distribution, and UPS products. She holds a Bachelor's degree in Electrical Engineering from the University of Minnesota and an MBA from Bentley College in Waltham, Mass.

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