Transform Your Data Center from Basic to Strategic by Increasing Operational Efficiency and Optimizing Intelligence

DRIVEN BY EXPLOSIVE DATA GROWTH, data center managers are juggling multiple, competing priorities. They need to hold down operational costs, improve energy efficiency and optimize capacity—all while maintaining network availability and reliability. To meet these demands, data center space is often underutilized and overprovisioned with power and cooling capacity, a situation that may be too costly to sustain.

Amid budget restrictions and corporate requirements for lower operating expenditures and total cost of ownership (TCO), the critical operational management challenges facing data center and facilities professionals include:

- Ensuring resilience and uptime
- Optimizing physical capacity and IT assets
- Balancing increasing power requirements with rising energy costs
- Complying with tougher environmental regulations
- Improving power usage effectiveness (PUE) by bringing their PUE rating down

For most companies, monitoring and managing the data center via instrumentation is key to increasing energy efficiency, reducing PUE numbers and getting a handle on costs. The more granular your insight into each row and cabinet, the more information you will have and the better and quicker your decisions will be, allowing you to be productive.

For example, temperature sensors deployed in the data center can give you visibility into a particular cabinet. If the temperature spikes in the middle of the cabinet, you can quickly provide more cooling to that spot, or you can move it to a place that is better suited from an environmental perspective.

Understanding where your equipment is can reduce break-fix time in identifying and locating the source of a problem, whether that is due to a lack of connectivity, a power supply issue or something else. The ability to receive an alert with detailed information on the problem and its source greatly speeds the mean time to repair (MTTR).

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Moving from Basic to Strategic

Increasing energy efficiency in the data center is not just about squeezing out a few more dollars in cost savings—the implications are more significant and far reaching. The higher an organization operates ASHRAE data center environmental guidelines, the more energy efficient it will be. It takes 70% of the IT budget to run the typical data center, according to IBM estimates, with just 30% available to pursue innovative new projects.[1]

CASE STUDY

Large Storage Technology Company Cuts Costs, Optimizes Space via Panduit Solution

Panduit recently helped a large storage technology company deploy a comprehensive solution to optimize its data center operations. The goal was to manage operating expenses (OpEx) and maximize available space, power, cooling and data communications resources, both now and in the future. The last point was particularly important for the client, which has experienced much growth that is expected to continue.

The company deployed a Panduit Intelligent Data Center Solution consisting of the Panduit Thermal Assessment and Optimization Service, Net-Contain™ Cold Aisle Containment System, Net-Access™ Cabinets and supporting cooling accessories for improved thermal management and maximum energy efficiency.

The cold aisle containment system helped the company optimize airflow distribution by preventing the mixing of cold and hot air streams, eliminating recirculation of hot air to cabinet inlets and providing uniform temperature at the inlets of IT equipment with less overall airflow. The result: cost savings due to better energy efficiency. Specifically, the Panduit® Net-Contain™ System allows the company to cool with 20% less airflow, which results in a much smaller volume of air to maintain the current set point, regardless of incoming building air, yielding tangible energy savings.

Intelligence Optimization

As for intelligence optimization, data center managers need enhanced visibility and control. Companies have the opportunity to reduce TCO through granular visibility into critical operational metrics of the data center, enabling the ability to manage proactively from anywhere in the world. Using a combination of intelligent monitoring devices, gateways and software, data can be collected from all zones of the data center, as well as from supporting building facilities, to yield actionable insights that can be used to fuel decision making and create better processes. Monitoring instrumentation is not just for companies building or expanding new data centers, says Tim Monner, solutions marketing manager for Panduit. “Legacy data centers now have the opportunity to integrate noninvasive monitoring solutions that can be deployed without disruption to operations, providing an easy way to gain insight into infrastructure performance.”

As part of the SmartZone™ Solutions portfolio, the Panduit Physical Infrastructure Manager™ (PIM™) Software Platform provides complete visibility of the data center and extended enterprise through software-based automation, predefined dashboards and reports, change management and related documentation, and combines with intelligent devices for increased functionality. In addition, the PIM™ Software Platform integrates with higher-level network management and service desk platforms to optimize data center operations.

“With the right instrumentation and monitoring you’re able to see operational efficiencies but you can also see where there is lost capacity or available capacity,” says Todd LaCognata, global solutions manager for Panduit. “That is a huge issue right now. Many companies think they are outgrowing their space but they may not be as lacking in space as they think.”

There have been reports of companies that built new data centers or expanded their space unnecessarily because they did not have visibility into space utilization. The use of a data center intelligence solution would have prevented this, adds LaCognata.

[1] http://www.slideshare.net/JohnKundtz/ibm-data-center-operational-efficiency-study-presentation-from-data-center-dynamics-nyc.

According to the IBM data, just 1 in 5 data centers are operating at the most efficient levels. These organizations, whose data centers earn the distinction of being called "strategic" in nature, are currently spending about 50% more of their total IT budget on new projects vs. maintaining their current environment than do companies that have basic data centers. Strategic data centers spend less than 50 cents out of every dollar to run the infrastructure while they devote 53 cents per dollar to new projects. The gulf between basic and strategic is huge.

Companies operating strategic data centers are able to spend more of their IT budget on transformative projects requested by the business. Best practices used by strategic data centers, according to IBM, include measuring PUE, following industry standards for operational effectiveness and monitoring thermal conditions through instrumentation. Increasing operational and energy efficiency while also leveraging data center intelligence can help your organization move from basic to strategic.

STRATEGIC DATA CENTERS SPEND LESS THAN 50 CENTS OUT OF EVERY DOLLAR TO RUN THE INFRASTRUCTURE WHILE THEY DEVOTE 53 CENTS PER DOLLAR TO NEW PROJECTS.

Focus: Operational/Energy Efficiency

When it comes to operational/energy efficiency, data center managers need to measure, improve and maintain. At the same time, they need to hold down costs by optimizing cooling energy consumption and getting the most out of data center floor space. Data center managers are increasingly using air containment systems to manage higher thermal loads. In an air-cooled data center, containment systems are used to effectively separate cold supply air from hot exhaust air to reduce the cooling system energy consumption.

Containment systems such as cold aisle containment and hot air containment (vertical exhaust ducts) prevent mixing of cold and hot air streams and enable cooling system energy savings of up to 40%, according to Panduit Labs estimates. This allows chillers to operate more efficiently, reducing energy consumption. A properly sealed cabinet is critical to obtaining this level of energy efficiency savings and achieving maximum cooling system performance with a containment system.

Space utilization can also be improved by leveraging cabinets and containment systems that optimize the separation of hot and cold air. Cabinets can be provisioned for thermal loads of 15kW or more per cabinet if power and cooling are managed effectively. This is important as energy and construction costs continue to rise, and overprovisioning and underutilization are no longer sustainable.

Power Usage Effectiveness: A Critical Measure

Data centers typically cost millions of dollars to build but the energy costs to run them can be many times more. The efficiency of data centers is typically determined by their power usage effectiveness, the metric established by the Green Grid and used to express how much of the power in the data center is actually used by the computing equipment (in contrast to cooling and other overhead). With a PUE start point of 1.0 indicating maximum energy efficiency, the majority of data centers are currently operating at well above 2.0, which would indicate there is still considerable room for improvement.

The Panduit Energy Efficient Data Center Cabinet System uses the seal, direct, contain and monitor approach to improving PUE:

- **Seal every gap for complete separation of cooling and exhaust air.** Complete air seal features reduce air leakage throughout the cabinet structure by as much as 25%, according to Panduit Labs. Net-Access™ Cabinets have been designed to eliminate every possible air gap other than those needed to mount equipment, minimizing bypass air and recirculation in the cabinet, providing lower inlet temperatures.
- **Direct cold air to where it needs to go.** Inlet Ducts enable optimized containment by effectively directing airflow to improve network reliability.
- **Contain cooling and exhaust air for maximum cooling capacity efficiency and space utilization.** Net-Contain™ Vertical Exhaust Duct and Cold Aisle Containment Systems eliminate hot air from recirculating and mixing with cold air, allowing room and chilled water temperature set points to be raised and PUE to be lowered; enabling cooling system energy savings up to 40%.
- **Monitor to maintain operational and energy efficiency.** Data center managers are challenged to maintain and manage energy efficiency gains in a highly dynamic environment in which power consumption and environmental variables are constantly changing. Without the ability to monitor these variables in the data center, efficiency gains, PUE reductions and capacity utilization can erode over time, leading to higher TCO. ■

CASE STUDY

U.K. Retailer Adopts the Panduit 6 Zone™ Methodology to Support Energy Efficiency Program

A major U.K. retailer enlisted Panduit which employed its 6 Zone™ methodology to create the foundation for a data center and enterprise-wide monitoring consolidation program. The 6 Zone™ methodology is a way of dissecting a data center or enterprise facility into distinct "zones," from a building's point of entry (Zone 1) right down to racks or cabinets (Zone 5) and individual devices (Zone 6). SmartZone™ devices and software were then deployed to monitor and capture data from these zones to provide greater understanding of how power comes into the retailer's facility and how it truly gets used.

The retailer deployed this zone approach for its new and legacy data centers, initially focusing on instrumenting Zones 4–6 (branch circuit PDU monitoring, through to cabinet- and device-level monitoring) to provide the level of granularity required to support a sustained energy efficiency program.

The client selected this approach to provide consolidated Zone 1–6 data collection and reporting. As part of this initiative, the client is integrating the monitoring of non-data center locations, such as offices and support buildings.

The client has now standardized this zone approach with SmartZone™ instrumentation to provide power and environmental intelligence across all of its new data centers. The first pilot site has been selected for integrated Zone 1–6 data collection and reporting. Two further data center locations have been selected to integrate fiscal and submetering (across all 6 zones). For all new requirements, the client's standard is now a Panduit fully integrated cabinet solution, including data center intelligence software to consolidate data collection and management reporting functions.

PANDUIT SMARTZONE™ SOLUTIONS PROVIDE A HOLISTIC VIEW OF CONNECTIVITY, ENERGY AND ENVIRONMENTAL PARAMETERS IN THE DATA CENTER AND EXTENDED ENTERPRISE.

Building a Smarter, Unified Business Foundation with Panduit

Panduit Intelligent Data Center Solution provides a combination of services, software and products that yield an optimized physical infrastructure. These work together when you are designing a data center, to ensure maximum energy efficiency and intelligence optimization.

Panduit SmartZone™ Solutions portfolio delivers a comprehensive energy and physical infrastructure efficiency in data centers, building facilities and remote enterprise sites through intelligent products, systems and services. By leveraging the pioneering 6 Zone™ infrastructure methodology for assessment, plan/design, integration and operation, SmartZone™ Solutions provide a holistic view of connectivity, energy and environmental parameters in the data center and extended enterprise. This can help to immediately improve operational and energy efficiencies, achieve rapid and significant cost reductions, and improve overall facility performance.

At the forefront of the SmartZone™ Solutions portfolio is a suite of infrastructure management software that includes enterprise-class DCIM tools that combine connectivity management data and dashboards with asset tracking, allocation and utilization information, enabling you to reclaim and repurpose IT assets effectively.

The SmartZone™ infrastructure management software centralizes the collection and visual representation of a rich set of asset attributes, such as connectivity, space/port availability and power/environmental data to ensure that your physical infrastructure supports mission-critical applications and enables effective optimization of your data center's space, power and cooling resources.

IT and data center managers have been struggling with a lack of relevant and accurate information on the status of power and energy performance, as well as assets and capacity. This lack of information is often at the root of disjointed, uninformed decision making. This has already resulted in growing fragmentation within data centers, especially legacy facilities, which can seriously compromise their overall utilization. Panduit end-to-end solution helps data center managers and IT directors build a smarter, unified data center foundation upon which they can support the needs of the business now and in the future.

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For more information on the Panduit Intelligent Data Center Solution for energy efficiency please visit **www.panduit.com/energyefficiency**