Integrated Data Center Infrastructure Optimizes Power, Space and Cooling While Reducing Complexity

THE GROWING COMPLEXITY OF THE DATA CENTER makes it difficult to find and retain people with all the essential skills needed to design and integrate the power, cooling, racks, cabling and management components necessary to run an efficient facility. As a result, there is significant risk associated with combining these elements into a reliable infrastructure solution. For example, network reliability may be in jeopardy if all of the components do not work well together.

Integrated infrastructure (incorporating power, cooling and physical infrastructure) is a way to increase capacity in the data center while reducing risk and complexity, deferring investment and safeguarding network reliability. Companies are using tightly integrated, aisle-based physical infrastructure modules, or PODs, along with non-containerized integrated infrastructure solutions to optimize utilization of power, space and cooling capacity while dramatically reducing the time and complexity of specification, design, validation, procurement and installation.

"This is a way to build data center capacity incrementally, unlike traditional cabinets and infrastructure components," says Robert Gallagher, solutions marketing manager, Panduit Corp., a provider of data center solutions. "One big advantage is the ability to delay capital spending. Instead of setting up 100% of the infrastructure on day one, they set up just 50% as integrated modules so they can build capacity incrementally."

Previously, there were three different approaches to implementing data center physical infrastructure, each with inherent challenges. Traditional options were: (1) use in-house resources to design and integrate all elements of the infrastructure; (2) rely on a single vendor; or (3) entrust multiple best-of-breed vendors to get it done. Today, however, there is a better way: an integrated solution of best-of-breed systems from one company.

The integrated best-of-breed approach ensures streamlined implementation through a single point of contact while preserving flexibility and agility. Such a solution also avoids the complex integration effort traditionally required for best-of-breed, speeding deployment and time to value.

CIO
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Different Approaches to Implementing Integrated Infrastructure

	Technical Competency	Time to Design/Deploy	Performance	Cost	Vendor Lock-In/ Flexibility
Build it Yourself	+	+	+	+	+
Single Source	++	+++	++	+++	+
Best of Breed	+++	+	++	++++	++++
Integrated Best of Breed	++++	++++	++++	++++	++++

++++ Optimum   **+++** Good   **++** Average   **+** Poor

The three traditional methods for implementing integrated data center infrastructure each have distinct disadvantages:

■ **BUILD IT YOURSELF.** This option is used mostly by very large companies that have in-house expertise in power, cooling, structured cabling and cabinets. For smaller companies, DIY increases risk because most lack the necessary skills internally, and employees don't have time to dedicate to the project, compromising performance. In addition, expanding your own data center capacity from scratch is often more expensive and time-consuming than anticipated. As a result, the cooling, power consumption and infrastructure are seldom optimized. Small to midsize companies in particular often lack expertise to optimize critical areas such as energy efficiency as well as heat and power density.
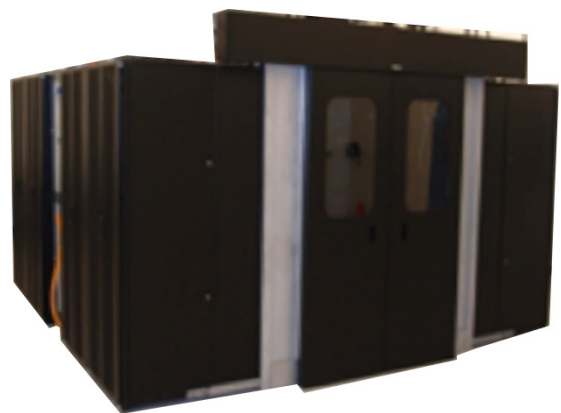
TYPES OF INTEGRATED INFRASTRUCTURE

Typically packaged in a modular container incorporating power, cooling, racks and cabling, PODs are a common type of preconfigured data center infrastructure solution — but they are not the only option. Integrated infrastructure can take the form of non-containerized solutions that are customized to fit a company's needs.

Shown on the left, PODs by their nature are preconfigured and assembled ready to deploy. Custom integrated infrastructure solutions, shown on the right, are more flexible, able to fit a company's unique space and various application requirements.

EXAMPLE OF A POD

EXAMPLE OF A CUSTOMIZED INTEGRATED INFRASTRUCTURE SOLUTION

INTEGRATED INFRASTRUCTURE (INCORPORATING POWER, COOLING AND PHYSICAL INFRASTRUCTURE) IS THE SOLUTION TO GROWING CAPACITY IN THE DATA CENTER WHILE REDUCING COMPLEXITY, DEFERRING INVESTMENT AND SAFEGUARDING NETWORK RELIABILITY.

■ **SINGLE-SOURCE SUPPLIERS.** Going with one off-the-shelf supplier is an option today as companies seek simplicity and clarity of support via a single contact. But there are risks here, too: vendor lock-in, maturity of offering and inflexibility. A one-size-fits-all solution from a single vendor can leave a company feeling boxed in. Not all vendors have the same solution maturity, for example, and there are often many differences among them. Many lack expertise in all aspects of physical infrastructure, cooling and power distribution, and are not able to provide needed functions and features without adding time and cost. Very often, a vendor is unwilling or unable to adjust its solution to meet the client's unique needs — it is simply not in the vendor's interest to do so.

■ **BEST OF BREED.** Companies often view best-of-breed solutions as a way to obtain the most advanced infrastructure capabilities in all areas. But they frequently underestimate the time, money and expertise required to integrate disparate solutions and manage multiple vendors. Vendors are often challenged to maintain a working knowledge of other vendors' products and systems. Trying to put together data center infrastructure from a number of different suppliers can mean each component has to compete for valuable real estate, resulting in a less than optimal arrangement. Often, companies that use this approach don't realize up front the interdependencies of functionality, long-term costs and impact on operational risk. In addition, many companies today are moving away from multivendor relationships in favor of working with a single vendor — the relationship is easier to manage and there is one source to hold accountable.

Faced with the array of pitfalls that come with each of these approaches, companies are discovering that an integrated best-of-breed infrastructure solution delivers the best of both worlds: the ability to optimize with the ease of managing a relationship with just one vendor.

PANDUIT POWER AND COOLING PARTNERS

Facilitating a new relationship with Stulz and Power Distribution Inc. (PDI), Panduit is working to help data center professionals achieve new levels of performance and efficiency in the three critical pillars of the physical data center environment — infrastructure, power and cooling. The partnership provides a single integrated solution that brings together best-of-breed products from Panduit, Stulz and PDI. This customer-focused approach to the development and installation of integrated physical infrastructure solutions addresses each customer's individual needs.

"Customers should expect specialized expertise in all the critical elements of their physical infrastructure," says Robert Gallagher, solutions marketing manager, Panduit Corp. "With these integrated, customer-focused solutions, they also get the synergy and best-of-breed solutions to maximize efficiency and flexibility."

Together, the Panduit Integrated Solutions partnership offers:

■ **INFRASTRUCTURE PERFORMANCE.** Panduit optimizes the performance of the physical infrastructure of the data center for high availability.

■ **ENVIRONMENTAL PRECISION.** Stulz enables precision cooling of the data center environment for efficiency and sustainability.

■ **OPTIMIZED POWER.** PDI assures continuity and control of power for the data center.

This partnership brings together best-of-breed subject matter expertise while enabling customized solutions that fit clients' unique needs.

Panduit Integrated Infrastructure Approach

- **INTEGRATED BEST OF BREED.** With an integrated best-of-breed approach, one supplier designs, integrates and delivers the power, cooling and physical infrastructure components from multiple vendors as one system. Panduit combines its comprehensive expertise with that of best-of-breed technology partners. The result is an integrated solution that is designed to maximize peace of mind for the client, delivering the utmost flexibility and eliminating the constraints imposed by a cookie-cutter solution. This approach also speeds the time of deployment while reducing risk, which allows organizations to focus their limited resources on data center operations. There's no need to become an expert in power, cooling and infrastructure, as a single supplier is responsible for the design and integration of all components. And this integrated approach typically reduces design time 20% by eliminating the integration work necessary to avoid interferences commonly encountered when multiple independent suppliers are used.

The Panduit Integrated Infrastructure approach gives clients a scalable, easily manageable data center environment incorporating power, cooling and physical infrastructure into one solution along with the simplicity of single-vendor support. Panduit adds value by consulting with the client to determine its unique needs. Panduit then leads the collaboration with its power and cooling partners to arrive at the best solution. The result is a highly robust solution that is unfettered by the limitations of other approaches.

Panduit best-of-breed hardware/software solutions deliver expanded, energy-efficient capacity. In addition to providing a robust "day one" physical configuration, the integration of Panduit's data center infrastructure management (DCIM) tool automates the collection of data upon which optimization decisions can be made at "day two" and beyond. The result: reduced power consumption, space optimization, extended equipment lifespan, and improved server reliability and uptime. With expertise from recognized leaders in the fields of physical infrastructure, power and cooling, capacity expansion solutions are designed to improve performance levels and reduce OpEx. Moreover, they can be deployed quickly while mitigating risks.

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—Robert Gallagher, solutions marketing manager, Panduit Corp.

Next Steps

To begin implementing an integrated data center infrastructure, take these steps:

- **EVALUATE.** The process begins with a conversation about your goals as well as an initial assessment to identify the type and level of support required. Led by Panduit, the partners then carry out a more detailed evaluation of the factors that will improve current performance (including power capacity, cooling capability, space and connectivity planning) and create a roadmap aligned to future business initiatives. The evaluation also takes account of strategies to mitigate risk in convergence, security, safety and compliance.

- **DESIGN.** At the design stage, the partners develop a deeper understanding of the logical network design, overall infrastructure and business objectives. Experts in each of the critical pillars of the data center environment understand the complexities and critical systems of infrastructure, cooling and power. They use their expertise to develop solutions that achieve new levels of performance and efficiency.

- **TRANSFORM.** Panduit and its partners bring decades of experience in their respective areas to ensure a successful implementation. A dedicated project management team works with experienced installation partners to deliver a scalable, integrated and well-planned physical infrastructure. The result is a transformed data center that has the flexibility and scalability to support the rapid, efficient deployment of new and innovative data center technologies.

Integrated Infrastructure Pays Off

A systems integrator was providing a new data center design for a co-location client that had become dissatisfied with its last supplier, a major provider of power, cooling and cabinets. The client found this company difficult to work with and unresponsive to any unique needs and requests. For example, there were overhead obstructions and fire suppression systems that made it difficult to integrate traditional aisle containment. Client requests to modify the equipment to accommodate the obstructions were not met with enthusiasm.

Additionally, during commissioning and post start-up, the supplier was unresponsive to requests for support. The overhead obstructions were preventing the cooling system from working properly, and hot spots were making it impossible to run the servers near capacity. As a result, the client saw no other alternative but to reach out to different suppliers for help.

For its next project, the client chose Panduit, with Stulz and PDI in supporting roles. Panduit Advisory Services led the initiative, starting with a review of the last project and a consultative conversation with the customer to ensure a clear understanding of the problems encountered and to provide alternatives for consideration. This dialogue led to a new design that resolved the overhead interferences, allowing for proper equipment cooling. Pleased with the success of the project, the client engaged Panduit Advisory Services for its next data center project.

Panduit has earned a reputation for world-class customer services and support as well as excellence in product and solutions design. Similarly, Stulz and PDI have decades of proven results and responsiveness. It is not uncommon for large power and cooling providers to be responsive for very large customers, but they do not always bring these qualities to small and medium-size data centers. Both Stulz's and PDI's responsiveness to their clients' special needs has become a key differentiator that they have leveraged to gain significant market share. They bring this strong asset to their partnership with Panduit.

According to Brian Hatmaker, vice president at Stulz USA, "Stulz products are available in a variety of configurations and options based on our factory-designed and tested components and modules. We can also provide a 'custom touch' to adapt our products to meet your specific needs."

Adds Dave Mulholland, vice president of marketing and service for PDI, "PDI Power Wave Bus System is a robust and configurable solution to meet the unique needs of customers."

Panduit Integrated Infrastructure Solutions bring together best-of-breed products from partners that are global leaders in power and cooling. This new approach to the development and installation of integrated physical infrastructure solutions allows Panduit to understand and better address customers' individual needs. ∎

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