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Global Insights Into How to Prepare the Data Center for a Remotely Working World

Chatsworth Products (CPI) experts weigh in on recommended ICT infrastructure solutions for today's interconnected world.

Although advanced technologies are taking a more prominent role in our day-to-day life, the Information and Communications Technology (ICT) industry faced unprecedented challenges in 2020: how to immediately transition administrative and professional staff and students to remote work and learning, how to maintain the network with limited access to facilities? Reliable connectivity was no longer a privilege, but a necessity. For data centers, uptime became critical. And to support the huge amount of connected devices and sensors, edge deployments sprawled. As a result, critical factors such as power management, cooling capacity and physical security have now taken on even greater importance. How will these trends impact the ICT infrastructure in a post-pandemic reality?



Chatsworth Products (CPI), a global provider of products and services that power and protect critical ICT infrastructure, is in a unique position to recommend technology to help jump start your upgrades and prepare for the future. In this paper, managers from CPI's regional offices around the world—in the United States, Canada, Latin America, Europe, the Middle East and Asia-Pacific—weigh in on the key drivers and solutions for the years ahead.

To begin, CPI proposes two important approaches that address both data center and edge deployments. Within the data center, CPI recommends a more holistic approach to operations, one which addresses power management, infrastructure and security as an integrated ecosystem that simplifies equipment management and capacity in both on-premise data centers as well as remote sites. As the network stretches to the edge, CPI recommends suppliers who can provide customizable, scalable and environmentally rated solutions that can support and protect new-generation equipment.



Intelligent Power Gains Traction in Light of Increasing Rack Densities and Demand for Remote Control in the United States

In many global markets, rack densities are continuing to increase. The greatest challenge for customers is managing available power within the rack so that all components in the power chain are meeting their power requirements. Rack power distribution units (PDUs) represent the last leg of the chain, so it is critical that organizations choose rack PDUs with monitoring capabilities for their high-density deployments to ensure that they meet the power requirements at the rack level. Higher equipment power ratings, a desire for more intelligent products, demand for advanced security features, and a need for power provisioning, capacity planning and remote control are requiring data center managers to rethink their power distribution strategy.

The latest examples of products that can help reduce the complexity of delivering power to equipment include three-phase PDUs equipped with power monitoring that stretches across the enterprise. Accessible through an IP connection, they enable the IT team to monitor anything remotely, down to the device level. CPI is seeing a growing interest in intelligent PDUs and this is expected to continue as customers prepare for technology upgrades, particularly as they revise their crisis response guidelines.

In the United States, average rack density is 6-10 kilowatts (kW) per cabinet, but many are being deployed at 20 kW, says Ashish Moondra, CPI Sr. Product Manager, Power, Electronics & Software.

"Having intelligent power distribution as part of your solution is a game-changer, with one major part being the cost savings," Moondra notes. "For example, to manage a remote site, you traditionally need an IP address for every cabinet. At an estimated \$500 per port, having several or in some cases thousands of cabinets can get expensive. CPI solutions can manage 24 cabinets with 48 PDUs and 96 environmental sensors with only two IP addresses."

Moondra is speaking of CPI's eConnect® PDUs, which provide current, voltage, temperature and humidity, and power consumption information, allowing IT managers to remotely monitor and control power, environmental conditions and cabinet access through a safe user-friendly interface. This remote power control functionality is particularly beneficial, as it reduces "remote hands" service charges for simple physical reboot activities. "Generally, the price of the PDU equates to the sum of a few remote-hand service charges, so the return on investment (ROI) is higher when supporting critical equipment like an interconnect switch, router or server," Moondra concludes.



Ashish Moondra
Sr. Product Manager, Power,
Electronics & Software

Ashish Moondra has over two decades of experience developing, managing and selling rack power distribution, uninterruptible power supply (UPS), energy storage and Data Center Infrastructure Management (DCIM) solutions. Moondra has previously worked with American Power Conversion, Emerson Network Power and Active Power, and has been an expert speaker at various data center forums.



Other World Regions Begin to See the Benefits of Intelligent Power

In Europe, average power rack density is increasing to an average of 7 kW per rack, according to Jon Barker, CPI Technical Manager for the region. This reflects in the increasing demand for CPI's intelligent PDU products at the 'Switched Pro' capability, and greater interest on three-phase models.

In these high-density environments, intelligent PDUs cost more than basic and metered units, but they provide the added value of being able to track and trend power use against known limits. If the site is power-limited, then the investment in intelligent PDUs and Data Center Infrastructure Management (DCIM) software to track power use may provide the insight to adjustments that extend the life of the site—a lower expense than adding power capacity.

"High-density data center architectures allow organizations to pack a lot of compute power in a small footprint. We see this now in Finance and Education sectors," Barker adds.

But how is the cost factor impacted if you have limited access to the facility? At CPI, we work with customers to help them realize that the perceived higher upfront cost of intelligent PDUs are easily outweighed by the long-term benefits of remote monitoring and ensured operations."

In Latin America, rack densities average from 1 kW to no more than 3-4 kW in most cases, although there are exceptions such as the financial industry, where densities are higher. This may change in the future. "Users are beginning to understand the need, but many are still unwilling to make the investment, and the limitations brought on by the pandemic have changed the minds of many customers," says CPI Area Director for Latin America, Alfonso Santos. "Price is the biggest pain point," he adds.

In the Middle East, customers are beginning to understand the benefits of intelligent PDUs. "IT teams want to manage fewer IP addresses, so they are looking for intelligent monitoring solutions that allow for a higher number of cabinets to be connected through only one or two IP addresses," explains Sundeep Raina, CPI Regional Sales Director in the region. "Consider that CPI PDUs integrate access control and environmental monitoring in the same hardware and software interface, which further reduces the complexity and saves procurement and installation costs."



Jon Barker,
Technical Manager, Europe

Jon Barker, CPI's Technical Manager for Europe, has over 25 years in the engineering industry, with 14 years specializing in data center infrastructure. As Technical Manager, Jon is responsible for resolving pre- and post-sales technical support questions and issues. Jon also provides support to CPI's Sales Team by delivering product and technology-based presentations to customers, channel partners and industry event audiences.



Alfonso Santos
Area Director, Latin America

Alfonso Santos is Area Director for CPI Latin America. Santos is an engineer in communications and electronics with more than 25 years of experience in the telecommunications and data center industries.



Protecting Data and Privacy

Data is the most valuable asset in the world, and everyone is impacted. As a result, data breaches have become a growing concern among businesses, social media providers, the government and private citizens. “A growing trend in the United States today is to bring protection to the cabinet level, because data must be protected wherever it is stored or accessed,” CPI’s Ashish Moondra explains. “Traditional mechanical locking systems, typically acceptable for secure data centers, do not meet the security requirements for an edge or remote deployment. In retail, for example, consider the network required to operate credit card transactions. The system, including networking equipment and cabling, is supposed to be secure, but who provides the security? It should be the corporate IT team, not the mall security team.”

Data center managers should be asking themselves, “How do I meet the security requirements for remote sites, while remaining compliant with regulatory standards such as PCI Security Standards Council (SCC) in the case of finances or the Health Insurance Portability and Accountability Act of 1996 (HIPPA) for health care?”

In Canada, security is handled primarily via typical keyed door handles on the rack and access cards on room and facility doors as well as security guards. “There is a trend toward electronic access control at the rack level. Having a detailed access log is important, and compliance issues related to PCI SCC and the North American Electric Reliability Corp. (NERC) standards are driving this level of physical security as well,” states Area Sales Director for Canada, Stew Munns.

Customers in Europe address equipment security from a physical and cyber standpoint. “We see a considerable number of inquiries related to electronic access control with two layers of authentication, like biometric and card, coupled with monitoring devices to better control and manage all equipment in a typical deployment,” CPI’s Jon Barker says.

Seeing the market need for a solution that would simplify intelligent power management and physical security, CPI patented an electronic access control solution that integrates with eConnect PDUs, providing a single interface to power, monitor, control and protect the data center cabinet. “We can provide cabinets, power equipment and access control solutions and put it all together into a single package, so the user can get up and running quickly,” says Moondra. “The integration of IT infrastructure, hardware and software from the same manufacturer eliminates the challenges and confusion that can result from pairing different products from different providers,” Moondra adds.



Thermal Management and Flexibility in High-Density Applications

CPI experts get many questions regarding thermal management, but they consistently get one question more often than others, “How can I manage higher densities with my current cooling capacity?” Other popular questions regarding airflow management and data center energy consumption include:

- How can I reduce my power consumption?
- Which air containment system is most efficient?
- How can I improve reliability remotely?
- How can I get new infrastructure up and running quickly?

These questions indicate that many do not yet grasp the benefits of intelligent power management and passive cooling.

In air-cooled, high-density data center and enterprise computer rooms, one of the most cost-effective methods of reducing cooling costs is implementing disciplined airflow management practices to isolate and separate hot and cold air within the room.

CPI Passive Cooling® Solutions address airflow inside the cabinet and within the room. Proper airflow management eliminates hot spots, allows IT managers to reliably raise room temperatures and increase return air temperatures. “CPI designs its data center cabinets with airflow management efficiency in mind, which makes it an intuitive, simple practice to maintain,” explains Duke Robertson, Sr. Product Manager of Cabinets and Thermal Solutions. “Our solution does not impact the level of redundancy, may help data centers gain points for green building programs and may contribute to eligibility for utility incentives,” he adds.

Supporting Flexible Operations

As connectivity becomes vital to the day-to-day life, data center operations must ensure 24/7 uptime and flexible operations. To expedite deployment, companies across the globe are utilizing third-party integrators to populate cabinets with compute, power and cabling, then transport fully loaded cabinets to the data center space where they are rolled into position and quickly brought online.

“This need for speed requires an innovative, robust cabinet design with the user in mind,” says Duke Robertson. This means rails and accessories are quick and easy to adjust, cable management solutions that accommodate a variety of applications, and there's a strong cabinet frame architecture that can withstand loads exceeding 4000 lbs.

“We live in a dynamic world, so customers need to have the capability of configuring a cabinet that is tailored to their exact specifications, with cable management, power and thermal accessories all factory installed,” Robertson adds.



Stew Munns
Area Sales Director, Canada

Stew Munns has been in the data center infrastructure sector for more than two decades. Munns has extensive knowledge of cabling components and cable management, as well as related hardware, both passive and active. Munns consults on data center design, taking a holistic view of the environment considering major components such as servers, switches, cabling type(s), cable pathways, cooling designs and power requirements.



Duke Robertson
Sr. Product Manager, Cabinets and Thermal Solutions

Duke Robertson joined CPI in December 2007 and has more than 20 years of experience in a range of disciplines including design, manufacturing, product management and product development. In his current role as Sr. Product Manager for Cabinet and Thermal Solutions, Duke manages the life cycle and performance of CPI's vast array of cabinet and thermal solutions platforms and is a key contributor to innovation and new product development.

The Hybrid Future: Cloud, Colocation and Edge Coexist

The cloud has revolutionized the distribution of software while enabling computing and storage as a demand-based utility model, and this has led to massive growth for cloud infrastructure. What impact will this have on other data center models such as collocated services, enterprise networks and telco buildouts? Simply put, the death of these other services is exaggerated.

“In the United States, we are seeing growth in each category,” says Sam Rodriguez, CPI Sr. Product Manager for Industrial Solutions. “Undoubtedly the fastest growth is in cloud infrastructure, colocation and the edge. But rather than everything moving to the cloud, we are seeing a move toward a hybrid model. Companies are using the cloud as their primary data center, but maintaining a smaller on-premises data center, and then extending the network to the edge, because everything is connected.”

Similar developments are occurring in Europe, with the cloud and colocation experiencing the fastest growth, while large corporations are looking at ways to reduce costs related to their IT network deployments and management.



Across the globe, in the Asia-Pacific (APAC) market, companies are leaning away from building their own data centers and moving to colocation, and to edge computing deployment for smart manufacturing and the IoT. “This requires that servers are close to the application to provide a quick calculation/response capability and to reduce the demand for networking bandwidth,” says Michael Zhang, CPI Technical Manager for APAC.

The Middle East also offers strong opportunities for IoT, according to CPI’s Sundeep Raina. “Our energy and manufacturing sectors are expected to deploy IoT on a large scale. Smart cities are being planned, and that is all about IoT,” Raina points out. “Health care also holds very high potential for IoT as hospitals compete with one another to be innovative. And looking further into the future, we are already talking about driverless cars powered by solar energy.”

Not every region of the world is moving at such a rapid pace. In Latin America, the market is interested, but growth will be gradual. “Our market traditionally responds to new technological developments after these solutions have been implemented in other regions,” CPI’s Alfonso Santos says. “Global corporations like Google and Facebook usually bring these new technologies into the region, and then local companies follow. Right now, this process is not happening as quickly as other regions.”



Michael Zhang
Technical Manager,
Asia Pacific

Michael Zhang has more than 16 years experience in the IT industry. From 1994 to 2000, Zhang was an IT manager in charge of the IT infrastructure for a global logistics company in the greater China area. His main roles included facilities manager, project manager, system consultant and trainer. Zhang’s expertise is in the field of structured cabling, data center facility management and project management. He was also invited to the Data Center Standards Board of Committee of Shanghai.

Protecting Equipment at the Extreme Edge

Keeping pace with the increasing demands of edge and IoT initiatives in the years ahead will require support and protection of critical equipment, regardless of where it is located. Like the proverbial chain that is only as strong as its weakest link, any limitations on network infrastructure, design or performance will result in unacceptable downtime. Environmentally rated enclosures and cooling accessories, and cable and power management solutions will play a key role in enabling network operations at the edge.

“The interesting thing about the edge is that it encompasses all the elements of the data center deployments. You have to deal with thermal management, remote monitoring and control, security, and know the environmental conditions within the enclosure. More importantly, you must deal with the environment where the enclosure will be located. Edge enclosures are the first line of defense for your sensitive and expensive equipment,” says Rodriguez.

Because there is no standardization at the edge, it’s important to maintain a strong network into harsh environments with infrastructure products that meet the highest quality and protection ratings.

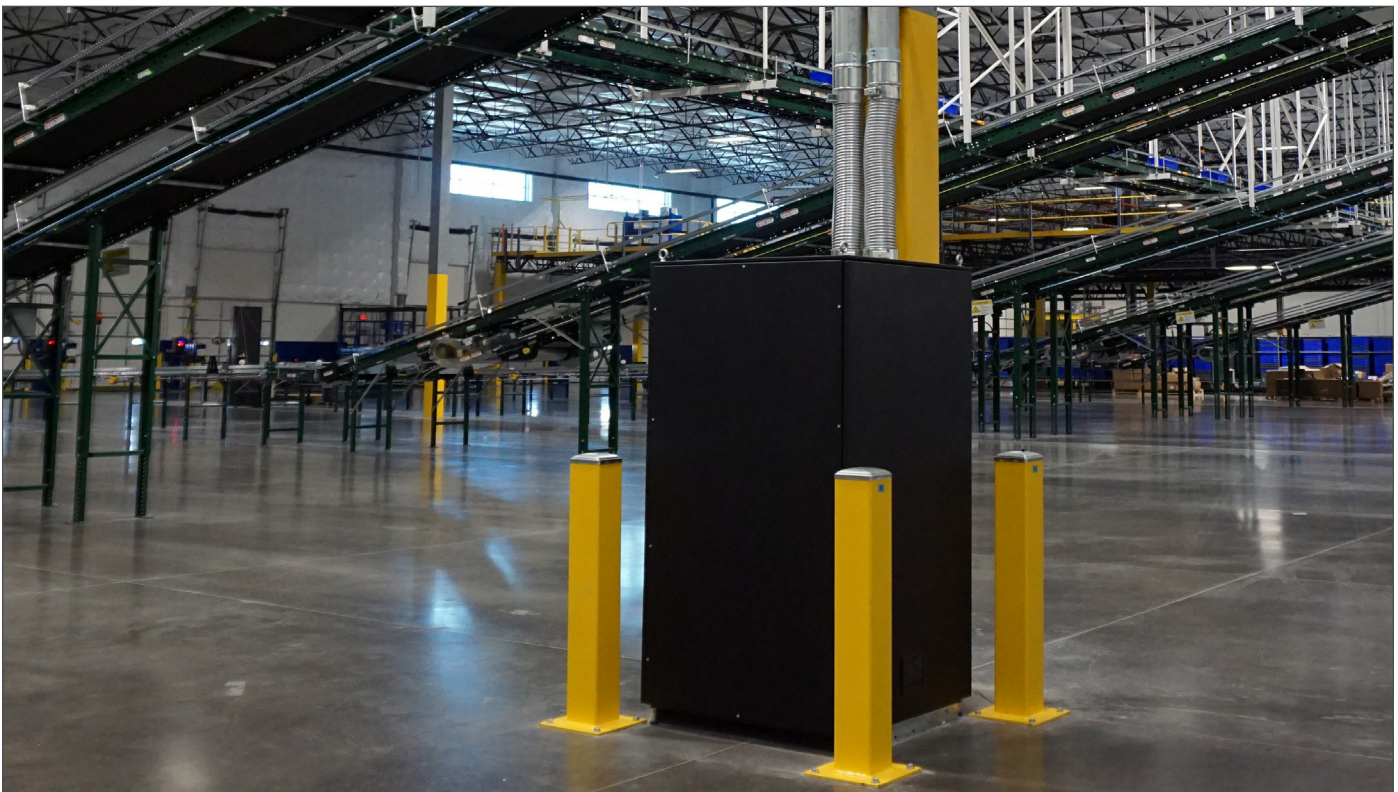
CPI RMR® Industrial Enclosures protect equipment in harsh indoor and outdoor environments.

RMR are certified NEMA- and IP-rated enclosures that can be fully customized to meet unique requirements such as nonstandard sizes, openings, accessory preinstallation and kitting, and color and mounting modifications.



Sam Rodriguez
Sr. Product Manager,
Industrial Solutions

Sam Rodriguez has more than 25 years of experience in the telecommunications industry. He has been employed at CPI since 1997 and has held various technical roles including Technical Support, Technical Services Supervisor, and now Senior Product Manager for Industrial Solutions. Rodriguez is a BICSI member and is RCDD certified. He is also a member of CPI’s product development organization and contributes to the design and development of new product solutions.



Driving Knowledge Forward: Training and Education

Power and thermal management questions tend to keep arising among customers. A combination of new technologies entering the market and lack of training and education may be the cause. CPI's experts agree that more industry training and education in all regions to ensure that customers have the knowledge to face the latest challenges posed by a changing market.

"This is an opportunity for us," says CPI's Alfonso Santos. "What's needed is training focused on the end user, to teach them how to control the effects of high temperature inside the room or the cabinet."

This is also true in the Middle East, according to Sundeep Raina, CPI Regional Sales Director in the region. "Users are becoming more educated, though training in Middle Eastern countries is not widespread. Our region has been lucky, as costs are not as high as in the West, but customers are feeling the pinch now. The fair bit of education we've been doing so far has been helping. We now see forms of aisle containment deployed in almost all data centers," Raina says.

To present the latest technology and fight misinformation in the market, CPI provides a variety of online and in-person training sessions and instructional seminars at sites throughout the world, including Mexico City, Shanghai, Dubai, Toronto and at CPI's state-of-the-art Research, Development and Training Center in Georgetown, Texas. These expert training services are also mobile, so that CPI can bring the training straight to the customer for personalized, educational sessions on-site or virtually. Additionally, CPI provides free Computational Fluid Dynamic (CFD) modeling to demonstrate the effects of all data center thermal strategies, so customers can visualize and understand the impact of each.



Sundeep Raina
Regional Sales Director,
Middle East

Sundeep Raina works as Regional Director for Middle East and Africa for CPI. Prior to this role, Raina was business unit head at TDME, (Now Ingram Micro) and headed the Cisco Solutions and Services division for the entire Gulf market. Raina has been working in the field of Information Technology & Services for over two decades.



Conclusion

It is clear that the rise of edge deployments and IoT-interconnected technology in all world regions will continue to create demand for upgrades in data center infrastructure. Properly planning and deploying such infrastructure can be a monumental task.

Take advantage of CPI's expertise and ability to provide complete product solutions, consultation services and lifetime technical support and be prepared for the exciting, digitally-connected future that lies ahead.

