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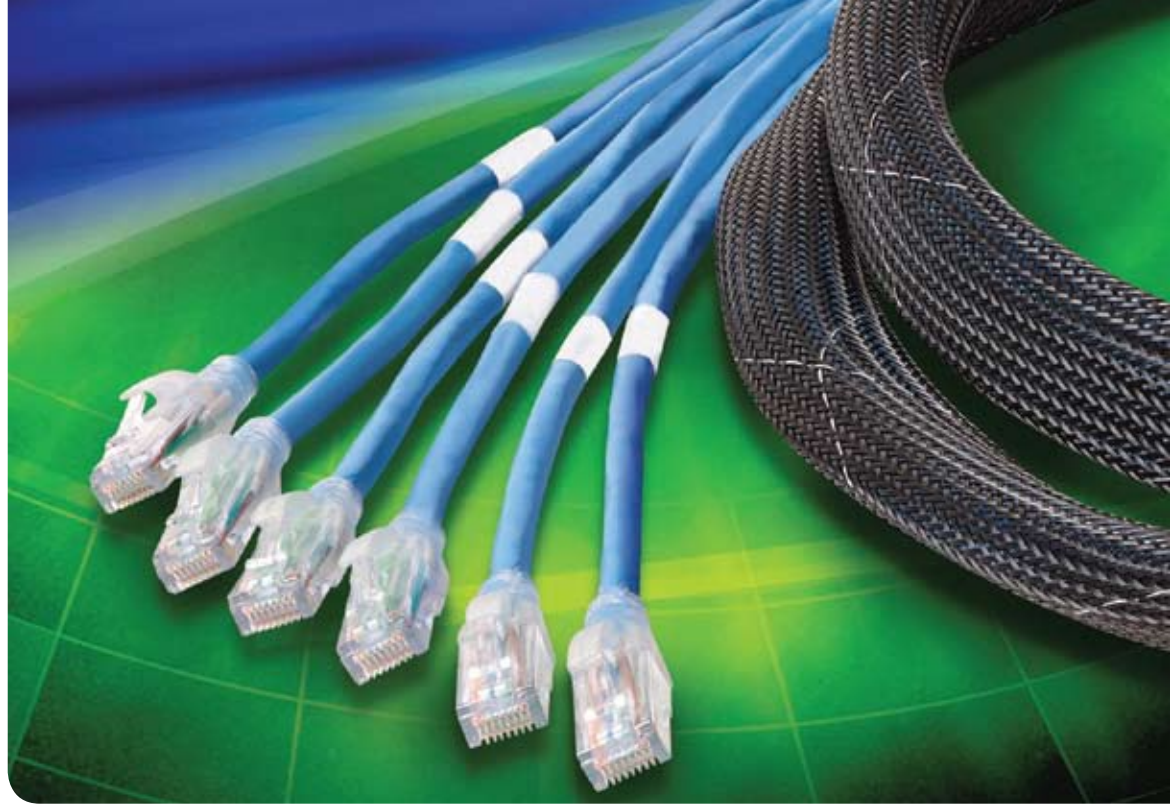
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## Bending Cabling Standards

For IP-based Security Surveillance

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Today's building owners and data center managers need to take the environment into account when selecting physical layer components and seek out innovative features that can help them be green.



# Going Green

## with Physical Layer Components

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Many ITS companies are keeping a keen eye on data center energy efficiency and the movement to build sustainable leadership in energy and environmental design (LEED)-certified facilities. However, the truth is that "green" is difficult to measure at the physical layer. As we move up the Open Systems Interconnection (OSI) model to Layer 2 (data link) and Layer 3 (network), we encounter active equipment that requires power. Here, it is much easier to calculate actual energy consumption and savings.

While it may be more difficult to determine the value of green in physical layer components, many solutions are available for all functional areas of the data center and throughout the facility that can help enhance energy efficiency, support sustainability and minimize waste. The use of ENERGY STAR servers and high-efficiency power distribution units (PDUs) is sensible, but without the right physical layer components to provide optimal performance, density, scalability and manageability, facilities may not be able to take full

advantage of today's more energy efficient equipment and deploy sustainable facilities. Today's building owners and data center managers need to take the environment into account when selecting physical layer components and seek out innovative features that can help them be green.

### Saving Space

Adding square footage increases a facility's overall carbon footprint and impacts the environment by requiring more materials. In the entrance room (ER) of the data center that houses access provider (AP) equipment and demarcation points, space is a significant concern. TIA-942, *Telecommunications Infrastructure Standard for Data Centers*, also recommends locating the ER outside of the data center for security purposes. This can potentially require even more space and materials.

In telecommunications rooms (TRs) throughout a facility that connect the local area network (LAN) to outlying areas, space is also a concern. Wall-mounted, high-density

optical fiber and copper patching solutions can save space in both the ER and TR. Many of these solutions offer user-friendly features to help manage high-density connections in less space, such as easy-to-view labels, swing-out doors for front and back access and intuitive cable routing.

Data center areas like the main and horizontal distribution areas that house power-consuming core switches include hundreds of connections at interconnects and cross connects for connecting to equipment and storage area networks. High-density solutions that take up less space while maintaining manageability are ideal in these areas of the data center. Ultra high-density patch panels are available that accommodate 48 ports in just 1U of rack space for double the density of traditional panels. Angled patch panels provide left or right patch cord routing, eliminating the need for horizontal cable managers and providing up to a 30 percent space savings in the rack. The racks also can be designed to provide more space efficiency. High-density vertical cable managers can effectively handle hundreds of cables routing to and from the patch panels and equipment.

Space is a concern in cabling pathways that connect various functional areas of the data center, as well as TRs and individual workstations throughout a facility. When larger or additional pathways are needed to accommodate the growing amount of cables and connections, facilities use more material and have a higher carbon footprint.

Within the data center pathways, optical fiber and copper pre-terminated solutions with bundled cable assemblies provide a smaller diameter that eases installation and cable management while requiring less space in pathways. Furthermore, pre-terminated solutions require less packaging, fewer consumables and reduced installation and labor. This means energy and waste savings throughout the manufacturing and supply chain process, all the way through to deployment. Studies show that pre-terminated solutions can provide up to 40 percent material reduction in data center cabling topology. In outlying

backbone and horizontal pathways that connect TRs and workstations, smaller diameter cables and patch cords also can save labor and significant space.

## Reducing Power Consumption

Today's active equipment consumes more operating power and must be kept cool. It is estimated that cooling accounts for up to 40 percent of a data center's total energy load. What's more, the cooling process itself is accompanied by excessive energy waste as computer room air conditioner (CRAC) units attempt to compensate for hot spots.

Most data centers use a hot aisle/cold aisle configuration to help contain hot air coming from the back of the equipment. To take full advantage of this configuration, data center managers should look for solutions that work with equipment enclosures to help maintain separation of the hot air coming out of the back of the equipment from the cold air entering the front. Solutions that accomplish this can significantly reduce the mixing of hot and cold air in the data center. This increases the differential between the inlet and outlet temperatures of a CRAC unit for better efficiency and energy savings.

For example, available heat containment solutions that mount atop enclosures automatically monitor heat loads and accordingly regulate fan speeds to pull the correct amount of air out of the enclosure for return to the CRAC units via plenum spaces. Several other devices are available for reducing power consumption in the data center. These include power distribution units with remote monitoring capabilities that allow data center managers to activate and deactivate individual outlets or groups of outlets and view information about temperature, humidity, airflow and smoke.

Improving airflow around equipment in racks and cabinets is key to maintaining optimal cooling and the hot aisle/cold aisle configuration. In addition to selecting cable management solutions that facilitate keeping cables away from equipment, data center

managers need to deploy common best practices to maintain neat, orderly cables with reduced slack that won't obstruct airflow.

## Improving Performance

As the core asset that connects users to the applications they need to communicate and perform daily business transactions, transmission performance and scalability across the data center and network are also extremely critical. But how does this impact the environment? When network components provide the highest possible performance and scalability, they not only support the very latest applications like 10 Gigabit Ethernet (GbE), but they also have the potential to support future applications. The longer the network components last, the more product obsolescence is avoided, waste is reduced and facilities can be overall more sustainable.

High performance cabling components allow data center managers to effectively take advantage of efficiency practices like server consolidation and virtualization that require more bandwidth. IT managers would be wise to deploy proven high-performance cabling components to keep up with bandwidth demands and ever-changing technology. Solutions like pre-terminated optical fiber and copper cable assemblies offer superior performance because they are factory terminated. These solutions can also be easily reused and redeployed throughout a data center to accommodate future moves, adds and changes (MACs) without needing to purchase new components and unnecessarily add to the waste stream.

## There's More to Going Green

While selecting the right network components can help reduce environmental impact and support energy efficient operation throughout the data center and LAN, there is much more to going green. Going green is about working smarter and more efficiently across all systems and operations within

## Classifying Green in ITS

In the ITS industry, there are essentially three ways to look at green—from the plant level, the product level and the system level.

**Plant**—Green at the plant level refers to efficient, environmentally-sound manufacturing processes and practices. It's about reduced waste, recycling and energy efficient technology deployed at the facility where a product is being made. This could refer to lean manufacturing processes that reduce waste, ongoing recycling efforts and the use of technologies like solar panels or lighting controls, or it could be overall environmental stewardship in the surrounding community.

**Product**—At the product level, green can refer to the materials that make up a product. For example, Restriction of Hazardous Substances (ROHS)-compliant components have significantly reduced levels of hazardous substances like lead, cadmium or mercury. It could refer to overall reduced amounts of packaging or material that goes into getting a product from the factory floor to the end-user.

**System**—At the system level, green is about products that help the customer reduce their impact on the environment. These are the solutions and systems that help companies and facilities enhance energy efficiency, support sustainability and minimize waste.

While going green at the plant level and product level are commendable efforts that need to be widely deployed and recognized, green at the system level is critical. Focus placed on the customer and providing systems and solutions that help many facilities across the world cut down on waste and energy consumption ultimately has the greatest impact.

a facility. That's where Internet protocol (IP) convergence comes in.

In recent years, Ethernet and IP have advanced to the point where it can now be used to transmit voice, video, security, industrial control and building management information as data signals across the network. Where facilities once had several proprietary systems running over their own cabling to their own equipment, IP convergence allows several building operating systems to operate as open networks that use the same cabling media and send data signals using a common protocol. This eliminates a lot of unnecessary cabling, equipment and material.

For example, many hospitals used to deploy separate coax networks for delivering TV and entertainment to patient rooms and waiting areas and another copper network for delivering Internet access and telephony. With the advent of voice over IP and video over IP, those systems can now run over the same network infrastructure.

In addition to reducing the amount of cabling and equipment, IP convergence enables facilities to improve efficiency of operations. Anytime operations are made more efficient, time, labor, materials and personnel are reduced, which significantly cuts down

on waste. With IP convergence, data from various systems can be centrally managed from one interface versus separate equipment and more easily shared between applications for simplified building operations.

With IP convergence, a network login can more easily interface with the security access control system to make sure the user did in fact enter the building. Security personnel can check surveillance cameras from anywhere on the network, or even wirelessly from remote locations. Critical alarms and notifications from life-safety systems can interface with the corporate LAN and telephone system to send alerts to personal computers (PCs), pagers, and even cell phones. Lights can automatically go on in an evacuation situation, and air-handling units can automatically shut down when smoke is detected. The possibilities are endless.

Total IP convergence is not yet a reality, and many systems are still deployed separately. However, as this way of designing and deploying building systems comes to fruition, it will ultimately result in overall simplified, efficient operations that significantly reduce waste and produce green, sustainable facilities. ■