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Power Over Ethernet: The Most Important Real Estate Investment You've Never Heard Of

Part 1 of a 3-Part Series, "Power Over Ethernet: The future of connectivity"

In a three-part series, Deloitte will explore how Power Over Ethernet (PoE) technology offers new ways to unlock energy efficiencies and drive cost savings. Part 1 provides an overview of PoE and its essential role in meeting energy-saving objectives.

Corporate real estate (CRE) executives are facing a myriad of challenges. High interest rates combined with financial institutions tightening their lending standards have resulted in a higher cost of capital and renewed efforts to reduce workplace spend.[1] At the same time, CRE executives are increasingly tasked to better monitor and reduce their carbon footprint as stricter sustainability reporting requirements loom. These pressures to identify cost-reduction opportunities and minimize energy consumption—while also creating an appealing office environment—have many CRE leaders thinking about underlying building and facility technologies in new ways. A recent Deloitte survey of CFOs found that 76% expect digital transformation and technologies to play a greater role in achieving their company's strategic goals this year. Additionally, 80% expect their organizations to embed more automation and digital technologies into their operations within the same timeframe.[2] PoE represents a revolutionary advancement in facilities infrastructure that can help executives navigate enterprise financial, technology, and sustainability objectives while still providing a contemporary workplace experience.

What is PoE?

PoE is a simple concept with profound implications. At the highest level, PoE is an access-layer technology that uses standard cabling to transfer data and electricity to a powered device. Picture the traditional Ethernet cords we plugged into our computers before the dawn of widespread Wi-Fi. Designed to both supply energy and transmit data to VoIP phones with one cable in 1997, PoE was initially able to deliver 15.4 watts of power per port, enough to power small devices such as IP cameras and wireless access points. However, much has changed.

Over time, PoE technology has evolved to supply more power per port. In 2018, the Institute of Electrical and Electronics Engineers developed standards to deliver up to 90 watts of power per port,

known as "4PPoE Type 4," with four interwoven cables used in parallel to maximize power. 4PPoE Type 4 allows businesses to power a whole new set of devices, which is a game-changing opportunity for building owners, engineers, and facilities teams. These devices include network routers, LED lighting, point-of-sale kiosks, printers, alarm systems, pan-tilt-zoom cameras, occupancy sensors, LCD televisions, HVAC systems, window shades, and USB-C laptops. Initiatives to support more than 100 watts of power per port are underway, which will continue expanding the portfolio of technologies PoE infrastructure can support.

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A focus on energy

Increased complexity in sustainability reporting requirements and the focus on green initiatives have caused executives to reexamine and reprioritize their energy consumption. The US Securities and Exchange Commission (SEC) recently adopted rules to enhance and standardize climate-related disclosures by public companies.[3] The new rules will require certain companies to disclose Scope 1 and 2 greenhouse gas emissions. For Scope 2 emissions—indirect greenhouse gas emissions generated from purchased electricity and other utilities—in particular, PoE allows executives to uncover significant efficiencies.

An easy entry point into PoE is LED lighting systems, which can be powered through an interconnected network that combines sensors, automation, and analytics. In addition to these systems capturing

data on energy consumption and lighting performance, sensors may also be integrated into light fixtures to collect anonymized data on space utilization as an added benefit. PoE also allows employees to tailor the lighting to their preferences, managing lighting levels via workplace apps from their mobile devices. Not only can employees customize their workspaces, but executives can also monitor and control the energy consumed by lighting across their office spaces.

Deloitte has seen real savings in its own office buildings by applying PoE principles. In Amsterdam, Deloitte powered 6,000 LED light fixtures with PoE infrastructure requiring minimal voltage compared to traditional lighting solutions. Deloitte used sensors connected to the LEDs to detect motion and daylight to inform the energy output of each light. Compared to conventional illumination, Deloitte's PoE LED lighting system is 50% more efficient.[4] PoE lighting with integrated sensors allowed Deloitte to capture better occupancy data and helped lower the annual cost of space per employee.
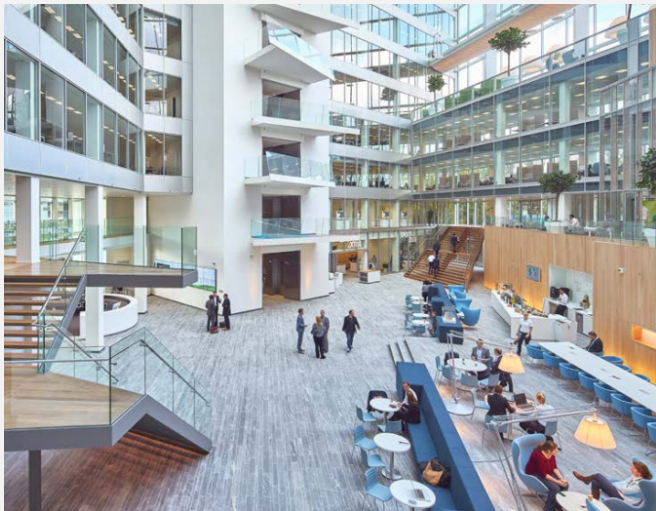
At Deloitte's Amsterdam office, 6,000 LED lights were installed to create a digital ceiling and integrated with 28,000 sensors. These sensors detect occupancy, movement, light, humidity, temperature, and carbon dioxide levels. Through a centralized data platform, the system transmits anonymized information on lighting performance, energy balance, space utilization, and employee preferences.[8]

Use cases showcasing PoE as an enabler of green initiatives are endless. Deloitte's Amsterdam office has installed fitness equipment in the employee gym that feeds wattage from workouts into the building's power grid, helping employees to directly see their own impact on their environment.[5] PoE-enabled occupancy sensors can be used to regulate and control window shades, automatically adjusting HVAC systems in real time based on daylighting heat loads to reduce power consumption.[6] Cisco recently launched a pilot program exploring the potential of bidirectional PoE to capture solar energy generated from photovoltaic window shades and distributing that energy back into a PoE switch. This technology is capable of preserving surplus solar energy, which can subsequently be utilized during high-demand periods when electricity from the grid is more costly.[7]

Looking ahead

PoE is a transformative stride forward in real estate infrastructure. The successful implementation of PoE at Deloitte is just one compelling example of the tangible benefits PoE can provide. In the next part of this series, we'll review an expanded set of use cases beyond lighting to understand how PoE is reshaping the workplace experience and providing an enriched data set to inform strategic insights for CRE executives.

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