



# Power over Ethernet steps up to support IoT-era demands

By Networks Asia Special Projects Team

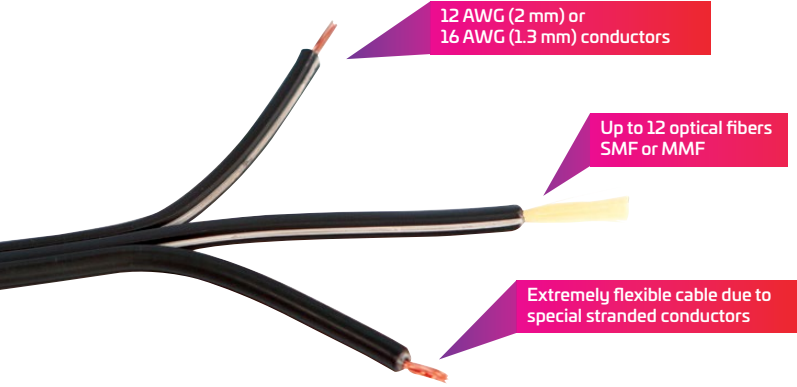
The fast-growing adoption of Power over Ethernet (PoE) received a further boost in 2018 with the expected publication of the IEEE 802.3bt Task Force's 4-Pair PoE (4PPoE) standard.

Grand View Research predicts that the worldwide PoE market will reach US\$3.77 billion by 2025, with the 4PPoE standard enabling network managers, installers, and integrators to support a wider range of applications and PoE powered devices. Factors fueling market demand include rising demand for smart building automation and control as well as central management of appliances and other powered devices.

For example, as smart buildings connect ever more devices to the network, PoE technology safely sends electrical power to the connected devices over Category 5 and higher (Category 6A recommended) cabling. This allows IT managers to drive even more value on their structured cabling, by using a single cable to power and connect IP devices. Hence, PoE's ability to deliver both power and data to important network assets – wireless access points, RFID readers, security cameras, lighting solutions, building automation and control systems, digital signages, and VoIP phones, etc. – over one low-voltage media is an attractive advantage.

While the IEEE 802.3at standard – also known as PoE Plus or PoE+ – specifies delivery of 25.5 watts to PoE-enabled devices, 4PPoE is designed to deliver at least 71.3 watts of power (assuming a 100-meter channel) to the powered device. It will enable more efficient, higher-power applications in commercial and industrial premises.

For the same current load, 4PPoE is designed to supply more power with greater efficiency than current 2-pair delivery while maintaining backward compatibility with IEEE Std 802.3-2012 Clause 33. Strikingly, 4PPoE is seen as a progressive step toward Power over 10GBASE-T, which is a 4-pair Ethernet Standard. Already supporting 10BASE-T, 100BASE-TX, and 1000BASE-T, 4PPoE support for 10GBASE-T will help to power, for instance, next-generation wireless access points efficiently.



## Cabling considerations

The analysis, design and implementation of PoE will require early involvement of key internal and external stakeholders, including facilities managers, IT executives, end-user representatives and the enterprise's technology partners.

To ensure that the cabling infrastructure is capable of supporting PoE, there are many factors to consider, such as the types of cables, cords and connectors to be used, bundling configurations, cable routing lengths, building topology and more. For instance, 4PPoE's support for power scaling, including the ability to regulate and completely shut down power to inactive devices, requires high-quality cabling to optimize power delivery.

In 4PPoE installations, network managers should also consider the overall network and channel requirements, effects on thermal and capacity limitations, and cabling and deployment strategies.

CommScope recommends running Category 6A cabling to each powered device, preferably using a zone cabling architecture, to improve thermal performance and energy efficiency while minimizing the cost of moves, adds, changes and upgrades. To accommodate capacity upgrades and ensure reliability, it is also recommended that two Category 6A cable runs be installed per connected device. So, each device will be powered from two zone distributors instead of one.



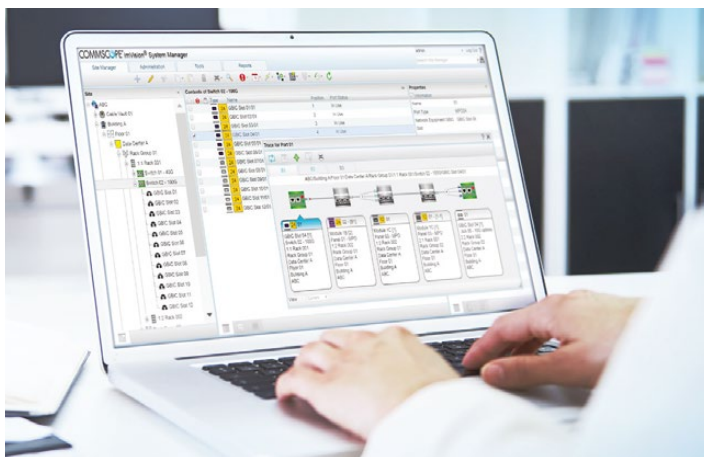
Topologies for supporting 4PPoE are presented in the ISO/IEC 11801 Generic Cabling for Customer Premises, ANSI/TIA-568-C.2 Balanced Twisted-pair Telecommunications Cabling and Component Standard, and the CENELEC EN 50173 series of Information Technology Generic Cabling Systems. CommScope's GigaSPEED XL or GigaSPEED X10D have been tested for compliance to the corresponding category or class described in these standards.

Meanwhile, the ISO/IEC 14763-2, ISO/IEC TS 29125, CENELEC TR 50174-99-1 and the TIA-TSB-184-A cabling installation standards recommend cable bundles with 24 cables or less to limit heat generated by current and to allow for worst case conditions regarding conductor gauge, powering and installation. For reliability testing, particularly addressing contact surfaces eroding due to connectors being unplugged under load, it is recommended that connecting hardware be qualified to support PoE and 4PPoE applications by using the test schedules in IEC 60512-99-002.

## Smart efficiency

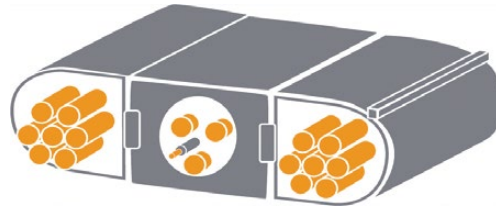
To enforce best practices and policies in adherence to industry recommendations, automated infrastructure management (AIM) will be vital to help organizations reduce operational costs and ensure optimal performance in an intelligently managed system like PoE.

With that in mind, CommScope has added System Manager v7.4 to its imVision Automated Infrastructure Management system that empowers IT managers to track the location of PoE powered devices; provide visibility into where PoE services are and can be deployed, and enable unique standards-based management of cable bundle sizes.



Further, serving the intelligent building marketplace today demands support for PoE and an ecosystem approach. In this regard, CommScope's networking experts work in standards organizations to help evolve PoE standards and directly with partners and customers to provide efficient PoE delivery solutions.

For example, CommScope's innovative Powered Fiber Cable System optimizes performance while easing the deployment of high-definition cameras, Wi-Fi hotspots and small cells for cellular networks under difficult access conditions. Further, by using hybrid cables containing copper and fiber wires that feed power and data to PoE extender devices, the system extends the 100m reach of a PoE channel up to a distance of 3km, increasing network coverage indoors or outdoors. This technology is also extending beyond Smart Buildings and into Smart City applications.



Clearly, PoE standardization and its implications on cabling and efficient power delivery is creating a timely opportunity to power the growing number of IoT devices being added to the cabling infrastructure efficiently and cost-effectively.

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