

Using Power-over-Ethernet to Improve Municipal Safety

Challenges at the Network Edge

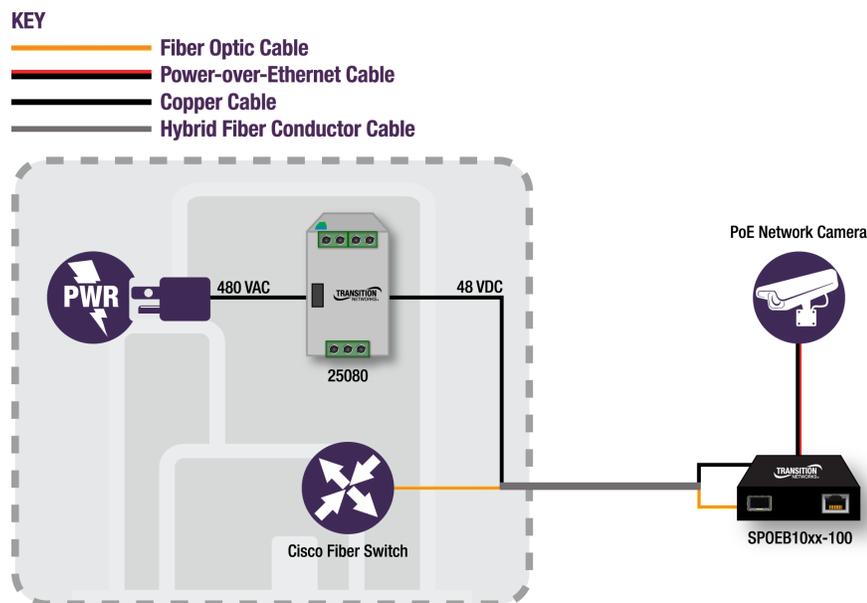
A Transition Networks customer looking to deploy an outdoor municipal network camera system for security and surveillance purposes was interested in using Power-over-Ethernet (PoE) technology and fiber-to-copper media converters to interconnect and power the high speed, high-resolution color cameras installed on luminaires (electrical light fixtures) at traffic intersections (see Figure 1). During design discussions with Transition Networks, two other unique factors about the installation site were uncovered: only 480VAC was available at each light pole, and each of the outdoor installations was located within 400 feet of a building with a power source. These discoveries could have presented a major challenge for the project. However, the Transition Networks PoE solution selected by this customer provided the features required to resolve all issues.

PoE Features & Benefits

- Gigabit PoE for higher speed networks
- Full system-wide IEEE 802.3af compliance
- Flexible external power for creative solution delivery
- Powered Device Reset on fiber data loss
- Optional redundant SFP fiber uplink ports for high availability requirements
- Lifetime Warranty
- Extensive application experience, knowledge and broad product portfolio offered by Transition Networks

The Optimum Solution

The goal for the project was to ensure a cost-effective, error-free total system solution. The customer found the answer to this challenge by working closely with Transition Networks.



First, a Gigabit speed media converter was selected for compatibility with existing Cisco Systems switches at the local end of the link, as well as to prepare the network for future growth. The Transition Networks **SGPOE** media converter filled the critical role of Gigabit copper-to-fiber conversion, while also injecting power onto the copper UTP cable using PoE technology. This converter also offered flexible options, such as redundant fiber up-links for high availability in security applications, and operation via an external DC power source.

Second, consideration was given to the climate of the city to determine whether extended temperature-rated or “hardened” products were necessary to accommodate seasonal or extreme temperatures in the environment. In this case, temperature extremes were not typical, so hardened products were not essential.

Third, only 480VAC was available at each light pole, which meant that a low-voltage way to power the SGPOE was still needed. From discussions with city engineers it was discovered that each outdoor installation was less than 400 feet from a building with a power source. The plan was to use hybrid copper/fiber underground cable to simultaneously carry Gigabit speed fiber optic data signals and to hardwire low-voltage DC power to the SGPOE.

PoE power sourcing equipment (PSE), like the SGPOE, is generally designed to be powered by either AC line voltage or 48VDC. In the case of the SGPOE, its input voltage is 48VDC with only a 2% tolerance for volatility. After some analysis, a consensus was reached to place a Transition Networks 25080 industrial power supply in the buildings that were located 400 feet away from the luminaires. This power supply converts the 480VAC power in the building to the 48VDC needed by the SGPOE media converter. It also allows for the adjustment of the output voltage so the SGPOE can receive the 48VDC it needs while accounting for the voltage line loss experienced over the 400 feet of power cable.

Finally, to ensure compatibility with the Cisco switches over the high-speed fiber links, Transition Networks’ [TN-GLC-LH-SM](#) Cisco-compatible Gigabit Small Form Factor Pluggable transceiver modules were chosen as the media converter interface.

Summary

As this example illustrates, there are often system-level design issues that extend beyond simple selection of a media converter. These issues should be considered in interconnectivity applications. If the installation environment had required use of industrial or hardened Ethernet devices to support a wider operating temperature range, the comprehensive product offering from Transition Networks’ would have met that need as well. Working with a solutions provider that can offer its breadth of knowledge and experience to the design team adds tremendous value to customers facing network edge technology deployments. For more information about Transition Networks’ PoE solutions, visit transition.com.