WHITE PAPER

Making a Case for Midspans versus Switches for PoE

Overview

There are two ways to deploy the latest high-power PoE technology: by upgrading the network switch, or by installing midspans in the existing networking infrastructure. PoE-capable switches offer the advantage of an integrated solution that requires only one cable for the network connection. However, this isn't necessarily the best choice. Unless shortcomings of existing data network infrastructure requires replacement of the switch to provide increased capacity or performance, and is required for low-power levels, midspans are the superior choice for PoE deployment. They deliver a combination of simplified deployment, management and maintenance, with superior flexibility, reliability, security and energy efficiency.

Benefits

- Restricted budget – Midspan saves CAPEX cost
- Port flexibility is needed – not all devices in the network are PoE capable
- 30W per port is needed, specially in high port count
- Need for power efficiency – Midspans offer time based PoE + less losses on cables thanks to 4-pair technology
- Quick and simple installation is needed – Midspans are plug and play, no need for switch configurations

Why Midspans versus Switches for PoE?

Midspans require no changes to the existing switch or cabling, and are generally compatible with any Ethernet switch. As shown in Figure 1, they are simply inserted between the existing switch and the powered devices (PDs).

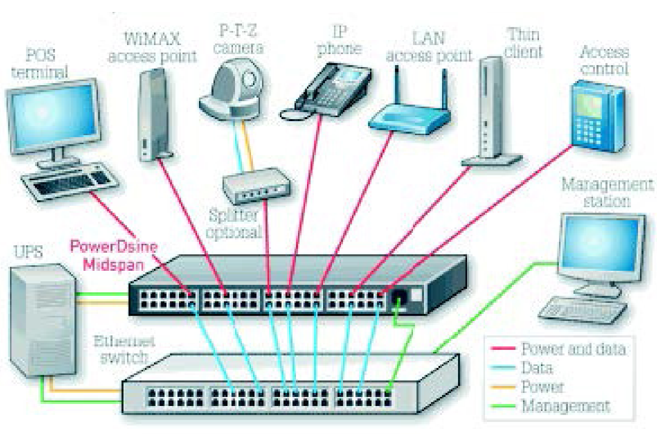

Figure 1. PoE Midspans Installed between the Network Switch and PDs

By decoupling the power and data infrastructures, midspans optimize network deployment and flexibility. Network powering capabilities can be upgraded independent of data requirements, and vice versa. When it is necessary to replace a switch, this can be done without having to pay for both data and power again.

Midspans also feature an interlocking capability that delivers higher port granularity than is possible with PoE switches. Organizations can deploy PoE in increments of 1, 4, 6, 12, or 24, when needed. This contrasts with a new switch installation, for which best practices prescribe PoE deployment on as many ports as possible to support future growth. Figure 2 illustrates how midspans decouple network power and data in a security application.

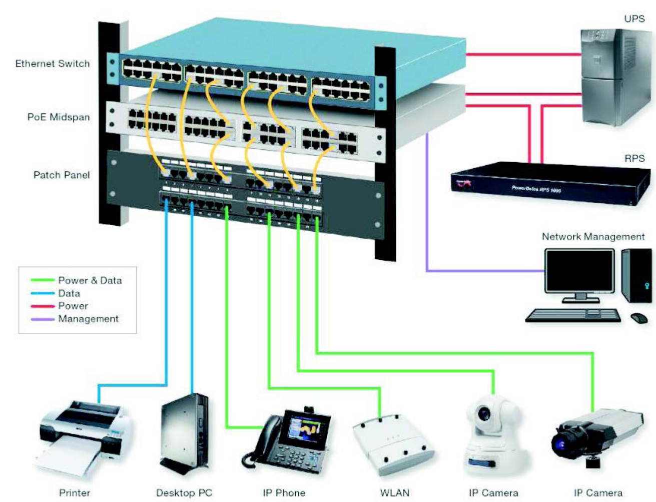

Figure 2. Midspans Decouple the Power and Data Infrastructures

This flexibility is specially important for organizations that cannot justify the expense of upgrading to a new PoE-enabled switch. Their existing non-PoE switch might only be a few years old, or they may only need a few ports with PoE capability. Midspans further improve flexibility by including a gigabit interface so that they can more easily support high-power PTZ cameras and thin clients. Other options that enhance flexibility include the ability to use DC inputs with external power supplies for incremental power capacity or redundancy, and the ability to flexibly power PDs from AC, DC or another midspan. Interconnected midspans can also back each other up for additional power device reliability.

Once deployed, a midspan-based PoE infrastructure is also safer and easier to manage and maintain. Safety is improved because midspans can detect and automatically disconnect non-PoE-compliant PDs in the event of overload, short circuit or under-load conditions. Midspans also deliver remote powermanagement capabilities for unit scheduling, UPS power monitoring and Web-based monitoring. Support for both IPv4 and IPv4/6 addressing allows simple and efficient monitoring, management, control and resetting of powered devices.

Remote power management increases in importance with network size and complexity. Malfunctioning remote devices can be reset remotely, eliminating an expensive service call. Network administrators can centrally control multi-site or multi-building installations, with support for immediate alert (e.g. E911) and response if IP phone status changes. When the midspan is integrated with a UPS system, the remote power-off/power-on capability also enables low-priority ports to be disconnected during power failures. Remote power management must be performed in a secure fashion, so SNMPv3 management is recommended to prevent malefic agents from interfering with network operations.

Web-based power management is also one of many features that enable midspans to deliver improved energy efficiency as compared to PoE switches. Selected ports can be powered up or down during the day, which can reduce power consumption by 70 percent. Midspans further improve energy efficiency by using a distributed power architecture with dynamic power management, which enables them to deliver only the power that is needed. One of the biggest energy drains is large PoE supplies that dissipate power even when not fully employed. For instance, a 48-port switch with 800W of full IEEE802.3af power per port might use only 20 ports at any given time. This wastes 400W of quiescent power. PoE midspans with a distributed power architecture solve the problem by augmenting smaller internal default power supplies with external supplies for incremental additional power or redundancy.

This improves system efficiency since each device's power consumption can be measured and actively reduced to accommodate only real-time needs. It also reduces cooling costs since smaller supplies require smaller and/or lower-speed fans.

Even better power efficiency is possible through good PoE system deployment practices. Midspans can be used alone or combined with PoE switches to power both low- and high-power devices for the most energy-efficient solution. For even better power efficiency, four-pair powering can be used to power two-pair devices with 30W of power, while dissipating up to half the power and consuming almost 15 percent less energy than conventional two-pair solutions. This translates into savings of approximately $25/year per powered device, assuming energy costs of $0.10 per kilowatt hour (KWH).

Figure 3 summarizes the advantages PoE midspans deliver as an alternative to PoE switches. By decoupling the power and data portions of the network infrastructure, midspans simplify network expansion and upgrades. They provide more flexibility for low-port count incremental upgrades to the power infrastructure, and they also include built-in support for high-power PTZ cameras and thin clients that require a gigabit interface. Midspans also typically improve mean time between failure (MTBF) rates as compared to PoE-enabled switches, which concentrate high power dissipation from the PoE section and the highly sensitive data section into a single box. Additionally, they deliver improved safety and reliability, and enable network administrators to remotely manage network power usage for added convenience, cost savings and energy efficiency.

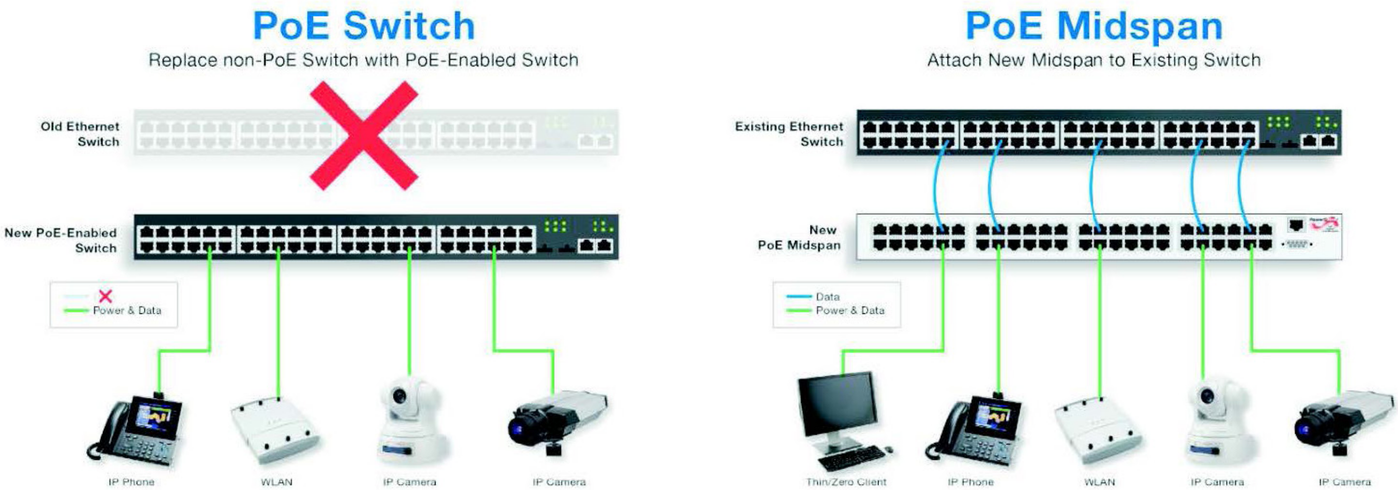

Figure 3. Midspans Offer a Variety of Advantages over Switches for PoE Deployment

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