

CYBERPATH SOLUTION WHITEPAPER

POWER-OVER-ETHERNET IN WI-FI NETWORKS

Introduction

With the final approval of the Power over Ethernet (PoE) standard in June, 2003 removed a significant impediment to wireless LAN deployment. Prior to the standard, positioning wireless access points (AP) where they were most needed often required an expensive visit from the electrician, who needed to run the power cabling to remote locations in the service area. The standard, IEEE 802.3af, specifies how to supply power to compliant devices over Ethernet LAN cabling, which greatly simplifies the task. Now one cable can serve two purposes.

The benefits of this enabling technology are not limited to Wi-Fi, however. Many applications that deploy equipment with low power requirements in areas which are not already wired for power will benefit from reduced cabling costs. A single standard Ethernet cable will now be able to provide both power and communication services to IP phones, IP cameras, security badge readers, and many other devices.

The list of the advantages PoE includes:

- Reduced cabling costs. One set of wires provides both power and data.
- Simplification of wireless LAN installs allowing easier installs and changes in location.
- A worldwide power standard—the first. This means that PoE devices will work in any country, without converters and special adapters.
- Reliability. A UPS at the power distribution source can guarantee power to all connected devices.
- SNMP network management. This system can be used to monitor and control connected devices. This includes resetting them and shutting them down remotely.

Technology Overview

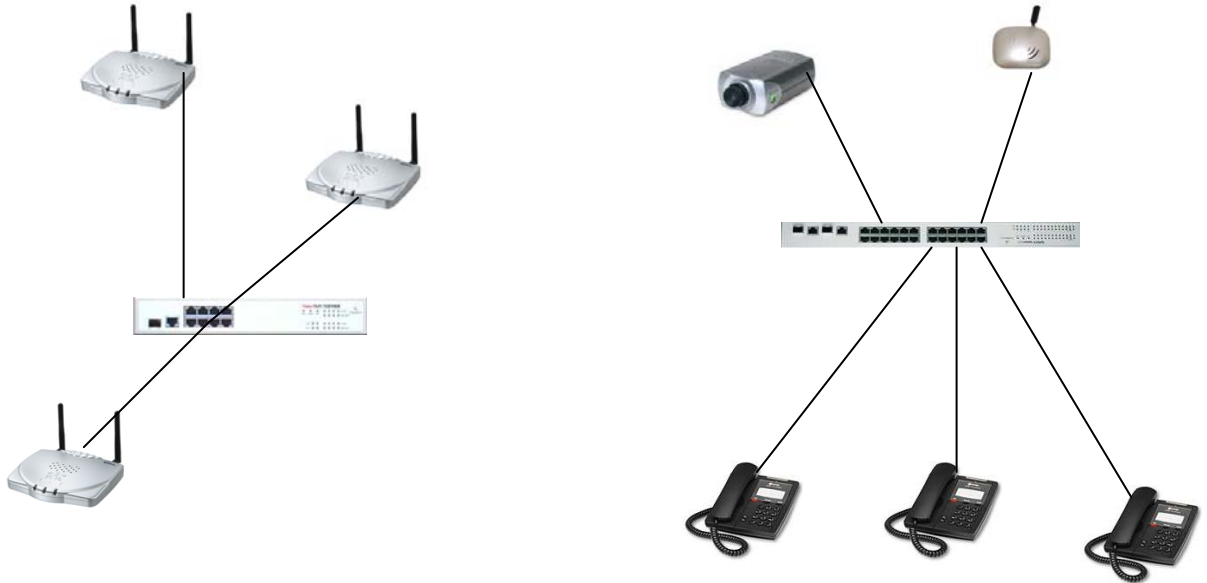
The 802.3af standard defines two new hardware components, power sourcing equipment (PSE), and the powered device (PD). The PSE is responsible for supplying up to 15.4 watts of power (at 48 volts) to the PD. DTE PSEs are PoE-compliant Ethernet switches and are sometimes called “end-span” PSEs. They can use pins 1/2 and 3/6 of the eight-pin Ethernet cable for both data and power. Power can also be “injected” into an Ethernet segment by using a single-port injector or a multi-port “mid-span” device, which sits between the PD and a legacy Ethernet Switch. These can use pairs 4/5 and 7/8 to supply power to a PD.

Because DTE PSEs and Mid-span PSEs place power on different pins, the 802.3af standard requires that powered equipment be engineered to accept power from either alternative. To power non-compliant equipment, devices called splitters can be installed. Splitters separate the DC voltage and data into different outputs that the non-compliant device can use. To avoid damaging non-compliant devices, the standard specifies a method of detecting PoE compliance before the full 48V applied. The standard specifies that the current delivered to each PD be limited to 350 milliamps and the total continuous power to 12.95 watts—factoring in power loss over the cable. This is insufficient for power-hungry equipment, such as servers, printers, and routers.

Power-Over-Ethernet in Wi-Fi networks (continued)

Network Application

CyberPath's PowerPath Ethernet Switches can provide Power-over-Ethernet for Wi-Fi deployments, as well as security cameras and VoIP Handset telephones. In this example, only standard Category 5 wiring is needed to network the devices and provide the necessary power supply to each device.



Conclusion

Power-over-Ethernet provides flexible and cost efficient network deployments for Wi-Fi networks and CyberPath's PowerPath series of Power-over-Ethernet switches are a fully compliant with the IEEE 802.3af standard.

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