Power over Ethernet for Residential Ethernet

Daniel Feldman - PowerDsine

Agenda

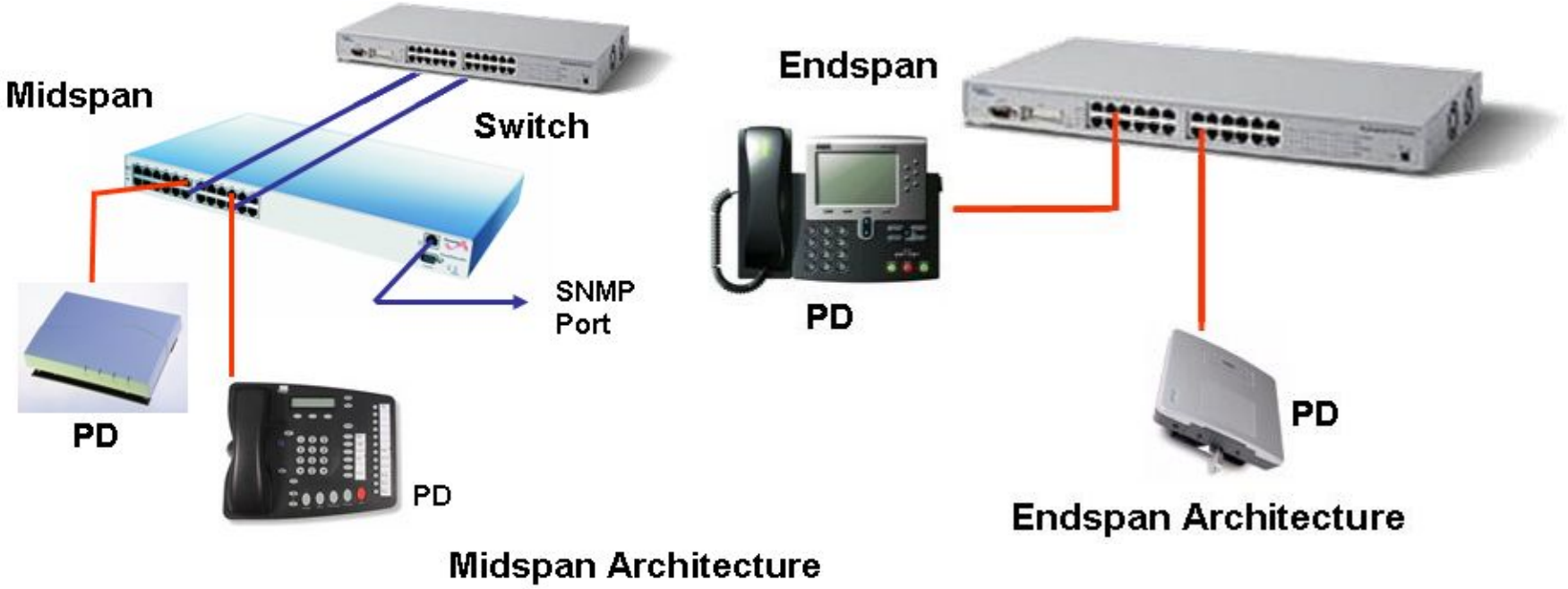
- What is Power over Ethernet (PoE)
- PoE at the home
- PoE for Residential Ethernet
- Benefits of PoE at the home
- Conclusion

What is Power over Ethernet

- IEEE 802.3af-2003 standard (clause 33 of 802.3)
- Transmitting safe and reliable power (15.4W, 48V) over existing Cat3/Cat5/Cat5e/Cat6 infrastructure
- Powering IP Phones, Wireless LAN Access Points and various network terminal
- Also known as Power over LAN, In-Line power, Active Ethernet
- Over 20 million PoE ports in the market!

PoE Terminology

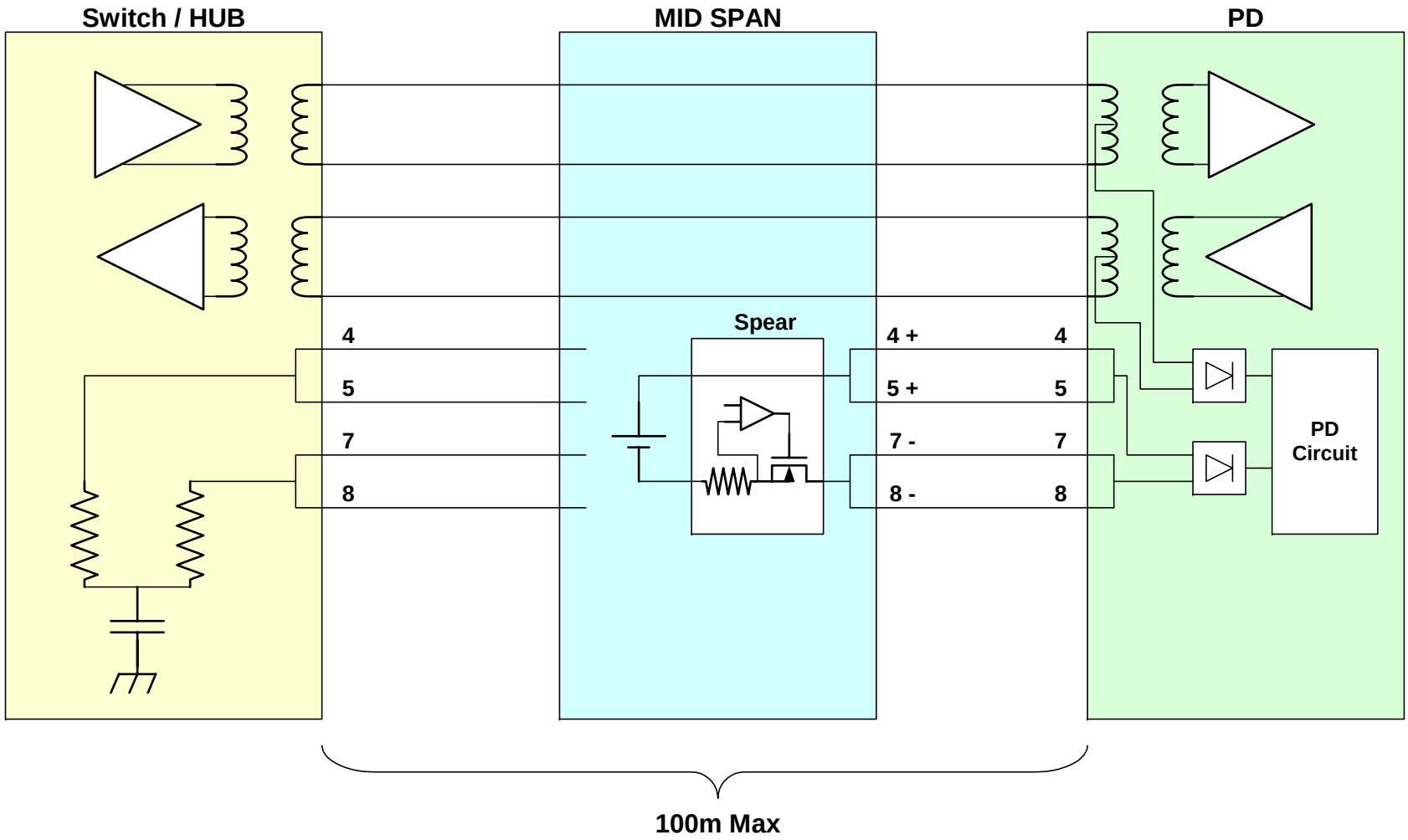
- **PD** (Powered Device) – PoE enabled DTE (e.g. IP Phone, WLAN AP)
- **PSE** (Powered Sourcing Equipment) – PoE enabled Ethernet source:
  - Endspan – PoE enabled Ethernet switch
  - Midspan - Power-Hub residing between the switch and the PD



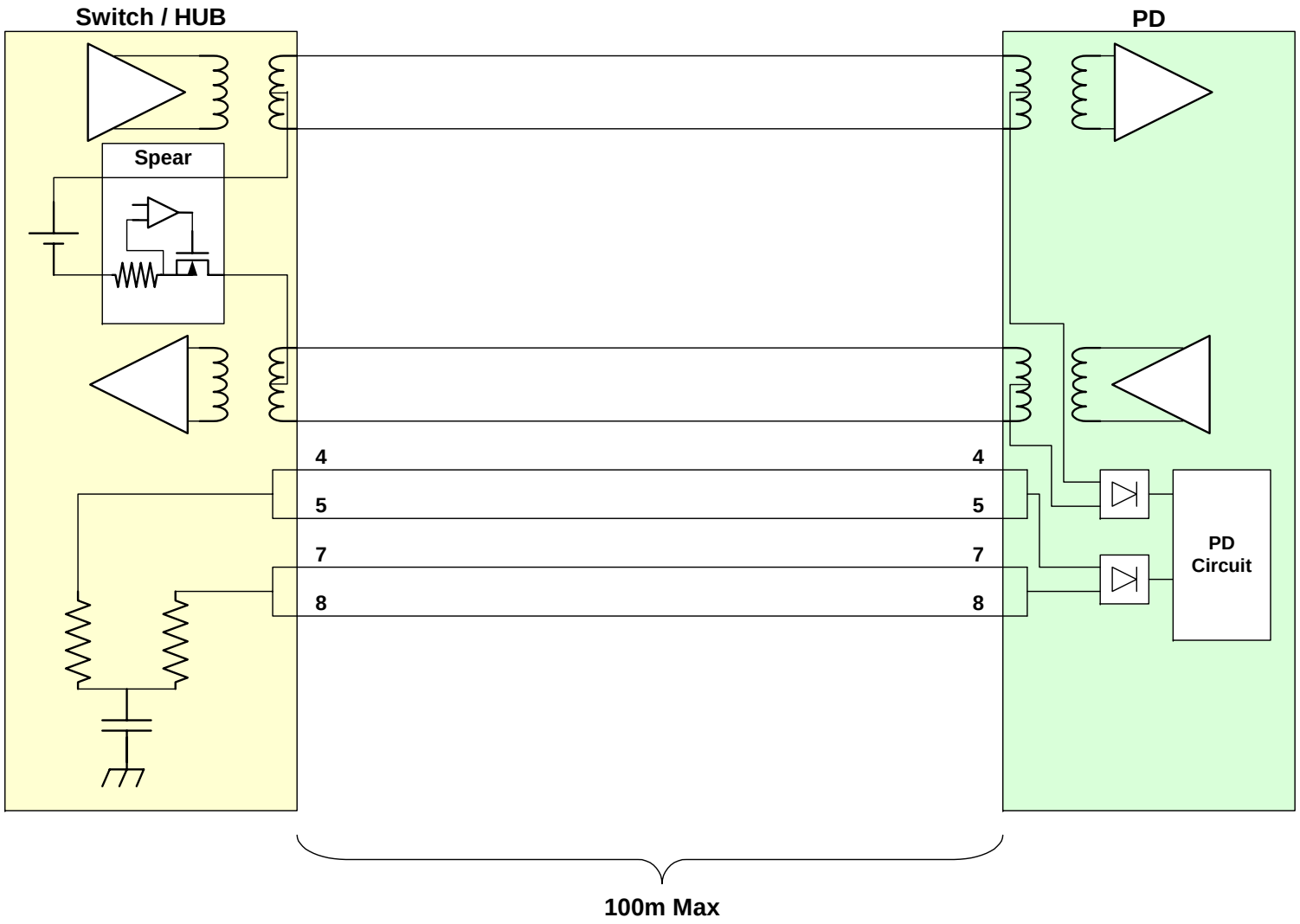
IEEE802.3af Main Decisions

- PSE output: 350mA continuous, 44Vdc to 57Vdc.
- PSE continuous average output power: 15.4W min.
- PD allowed consumed power: 12.95W max.
- Midspan supplies power on spare pairs only: 4/5 (+), 7/8 (-)
- Endspan supplies power on either data pairs: 1/2 (-), 3/6 (+) or spare pairs: 4/5 (+), 7/8 (-).

MidSpan PoE Architecture



EndSpan Architecture



PoE at the home

- Home offices
  - IP Telephones to the home
- “Big” homes
  - Require more than one WLAN access point for coverage
- Security at the home
  - Network cameras can be viewed from anywhere

→ SoHo routers with PoE are being developed now!

  - Expected in the market during 2005

PoE for the emerging ResE standard

- Audio/Video
  - iPod (12W)
    - Today powered via IEEE1394/USB 2.0
    - Apple has sold 3.72 million of the players, including 860,000 in the 3Q ’04 alone (Source: Bloomberg October 2004)
  - Other MP3 players
    - Currently have USB 1.1/2.0 port
  - Digital Camcorders (3W to 20W)
    - Have IEEE1394 port
    - 3W-7W operating
    - Up to 20W needed for fast charging
  - Ethernet Speakers (5W to 40W)
    - As part of distributed music system over the network
  - LCD Monitors ????
    - 15” monitor requires around 30W
  - DVD Player + VCR (~25W) ???

PoE for the emerging ResE standard (cont.)

- Storage
  - Network Attached Storage (NAS)
    - Already Ethernet-based: 15W-40W
  - External Hard-drive
    - Ethernet / IEEE1394 / USB 2.0 based: ~ 18W
  - External DVD/CD-RW
    - IEEE1394/USB 2.0 based: ~18W
- Musical Instruments
  - Electrical Guitars
    - Gibson Guitar is already PoE-compliant
  - Electric Keyboards
    - 3.5 million Home-use electric keyboards sold in 2003 (Source: Yamaha)
    - “Computer –friendly” models have MIDI or USB interfaces
    - Power Consumption: 10W to 20W

Benefits of PoE at the home

- Safer than AC extension cables
  - You can place that speaker near the swimming pool
- Affordable deployment
  - No need for certified electrician for
    - Security cameras
    - Monitors
- No need for clumsy power supplies
  - Many applications already powered with data

Conclusion

- Power over Ethernet is a standard way to provide up to 15.4W over CAT5 cabling
- Power over Ethernet already has residential applications
- Several ResE target applications are in the PoE power range

- Residential Ethernet should be compatible with Clause 33 of 802.3