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Certified Wireless Network Administrator (CWNA)
PW0-106

Chapter 17
Power over Ethernet (PoE)

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Chapter 17 Overview

- History of PoE
- PoE Devices
- Planning and Deploying PoE

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History of PoE

- PoE provides power to devices over Ethernet cables
  - Commonly used for VoIP desk phones
  - Used for APs and other network devices
  - The PSTN uses power over phone lines to power analog traditional phones

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PoE Types

- Nonstandard
- 802.3af
- 802.3-2005, clause 33
- 802.3at-2009
- 802.3-2012, Clause 33

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PoE Devices

- Powered Device (PD)
  - Draws or consumes power
- Power-Sourcing Equipment (PSE)
  - Provides power
  - Endpoint PSE
  - Midspan PSE

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Values used to identify the various classification signatures.

Parameter	Conditions	Minimum	Maximum	Unit
Class 0	14.5 V to 20.5 V	0	4	milliampere (mA)
Class 1	14.5 V to 20.5 V	9	12	mA
Class 2	14.5 V to 20.5 V	17	20	mA
Class 3	14.5 V to 20.5 V	26	30	mA
Class 4	14.5 V to 20.5 V	36	44	mA

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Classes of PoE devices

Class	Usage	Range of maximum power used	Class description
0	Default	0.44 W to 12.95 W	Class unimplemented
1	Optional	0.44 W to 3.84 W	Very low power
2	Optional	3.84 W to 6.49 W	Low power
3	Optional	6.49 W to 12.95 W	Mid power
4	Type 2 devices	12.95 W to 25.5 W	High power

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Classes of sourcing devices

Class	Minimum power from the PSE
0	15.4 W
1	4.0 W
2	7.0 W
3	15.4 W
4	30.0 W

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PoE Devices (Endpoint PSE)

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PoE Devices Endpoint

- Alternative A - the PSE places power on the data pair
- Alternative B - provides power on the spare unused pair of wires in a 10BaseT/100BaseTX cable

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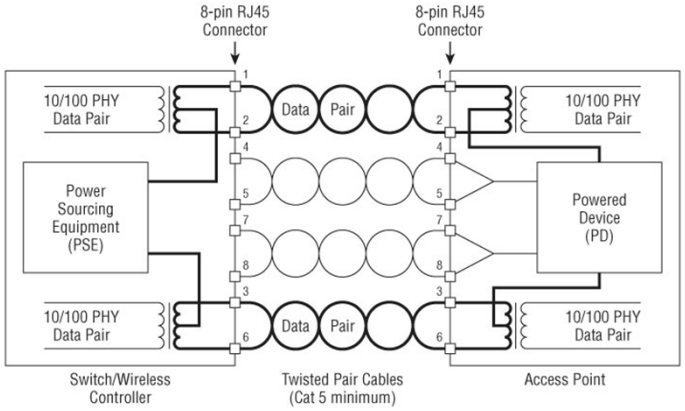
PoE Devices Endpoint (Alternative A) 10BaseT and 100BaseTX



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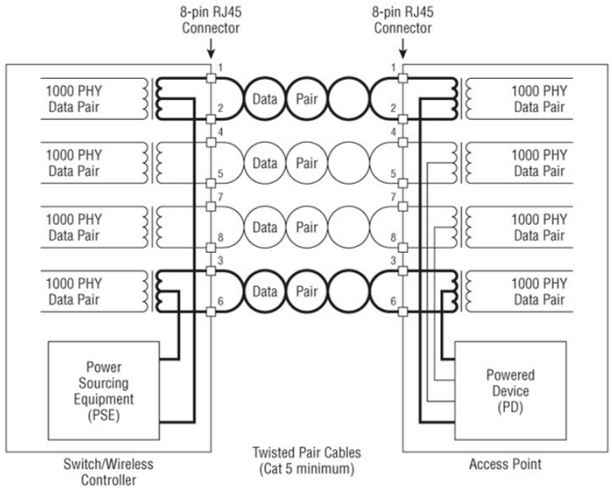
PoE Devices Endpoint (Alternative A) 1000BaseT



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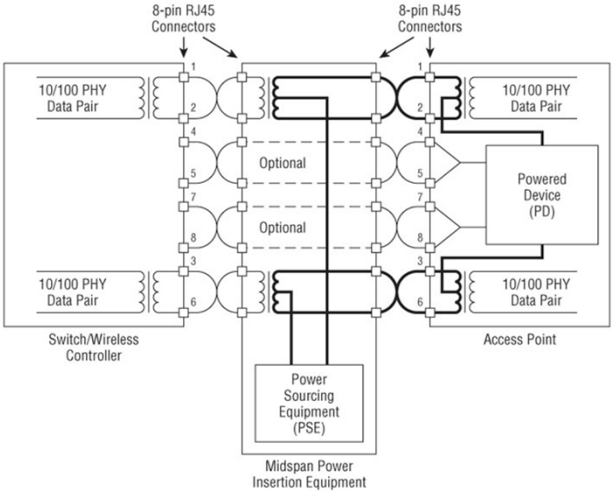
PoE Devices Midspan (Alternative A) 10BaseT and 100BaseTX



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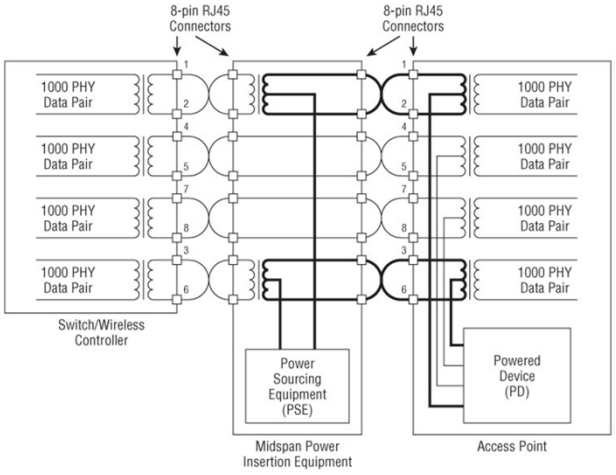
PoE Devices Midspan (Alternative A) 1000BaseT



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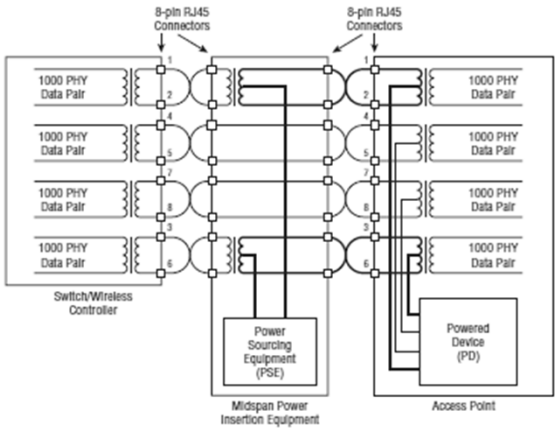
Power-Sourcing Equipment Pin Assignments

1000BaseT midspan PSE, Alternative A



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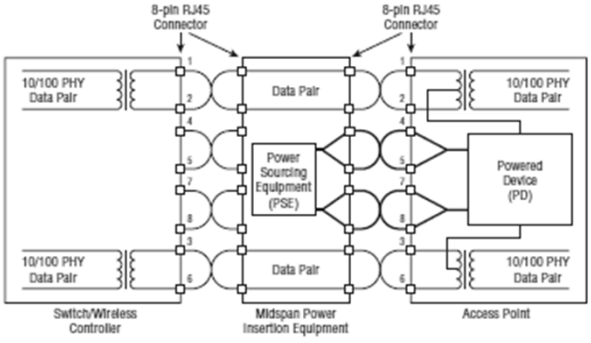
Power-Sourcing Equipment Pin Assignments

10BaseT/100BaseTX midspan PSE, Alternative B



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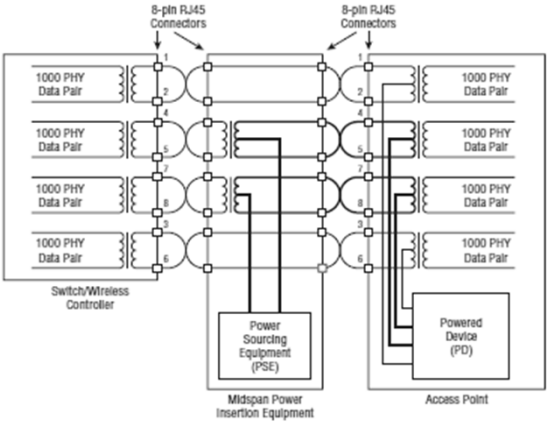
Power-Sourcing Equipment Pin Assignments

1000BaseT midspan PSE, Alternative B



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PowerDsine power injector and PoE hubs

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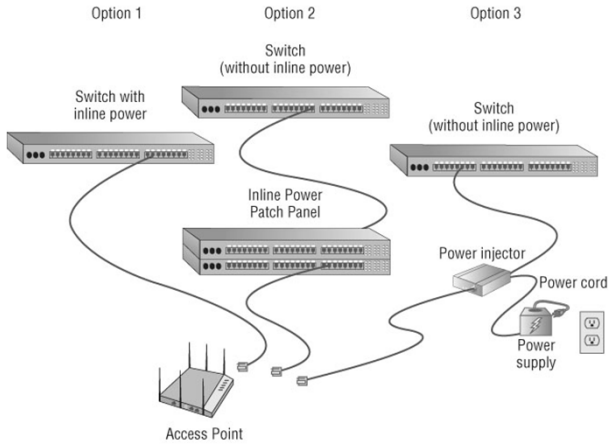
PoE Devices
Three PSE Solutions



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Planning and Deploying PoE

- Power planning
  - PSE must be capable of providing needed power
- Redundancy
  - Devices powered by PoE must have failover options in enterprise deployments

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Port level PoE budgeting

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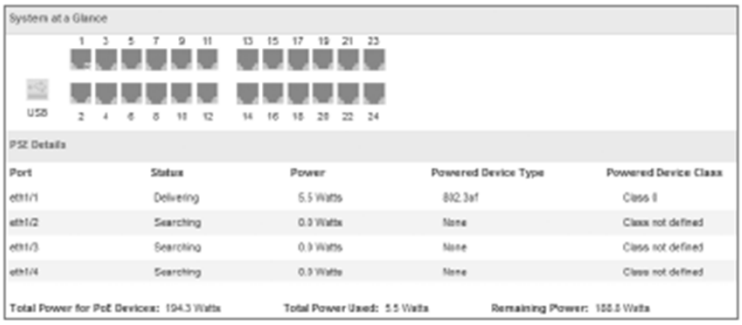
Power budget monitoring



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802.11n or 802.11ac and PoE

- Almost all of the current generation of 3x3:3 dual-frequency 802.11n APs are capable of running with full transmitter capabilities using 802.3af PoE
- The next generation of 802.11ac hardware will use a new chipset that enables beamforming capabilities, which will require more processing resources and therefore more power

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Fluke NetTool Series II inline network tester

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