

PoE

Power over ethernet

What it is

- Power over Ethernet, or PoE, describes any of several standards or ad hoc systems that pass electric power along with data on twisted pair Ethernet cabling.
- This allows a single cable to provide both data connection and electric power to devices such as
 - Wireless Access Points (WAPs),
 - Internet Protocol (IP) cameras, and
 - Voice over Internet Protocol (VoIP) phones

- There are several common techniques for transmitting power over Ethernet cabling.
- Three of them have been standardized by Institute of Electrical and Electronics Engineers (IEEE) standard IEEE 802.3 since 2003.
- These standards are known as
 - alternative A,
 - alternative B,
 - and 4PPoE.

- For common twisted pair cable, only two of the four signal pairs in typical Cat 5 cable are used.
- Power is transmitted on the data conductors by applying a common voltage to each pair.
- Because twisted-pair Ethernet uses differential signaling, this does not interfere with data transmission.
- *Power sourcing equipment* (PSE) are devices that provide ([source](#)) power on the Ethernet cable

IP camera
using PoE



- VoIP phone with PoE

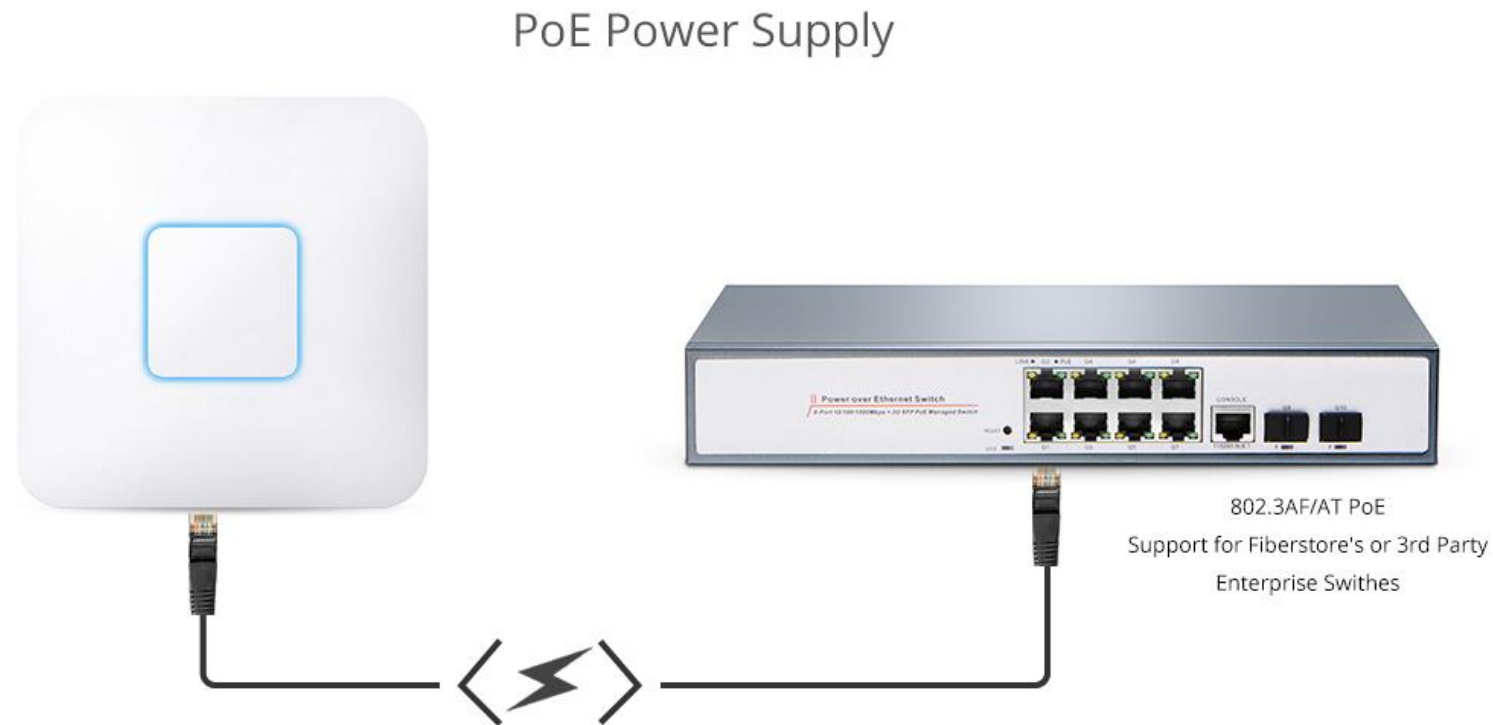


Power over Ethernet IP Network clocks

- Connects to existing Ethernet Infrastructure with a single Ethernet cable.
- Synchronization software is used to establish communication and time settings.
- Once connected, synchronization software discovers each clock and allows the user to choose universal or individual time source, time zone, and Daylight Saving Time settings.



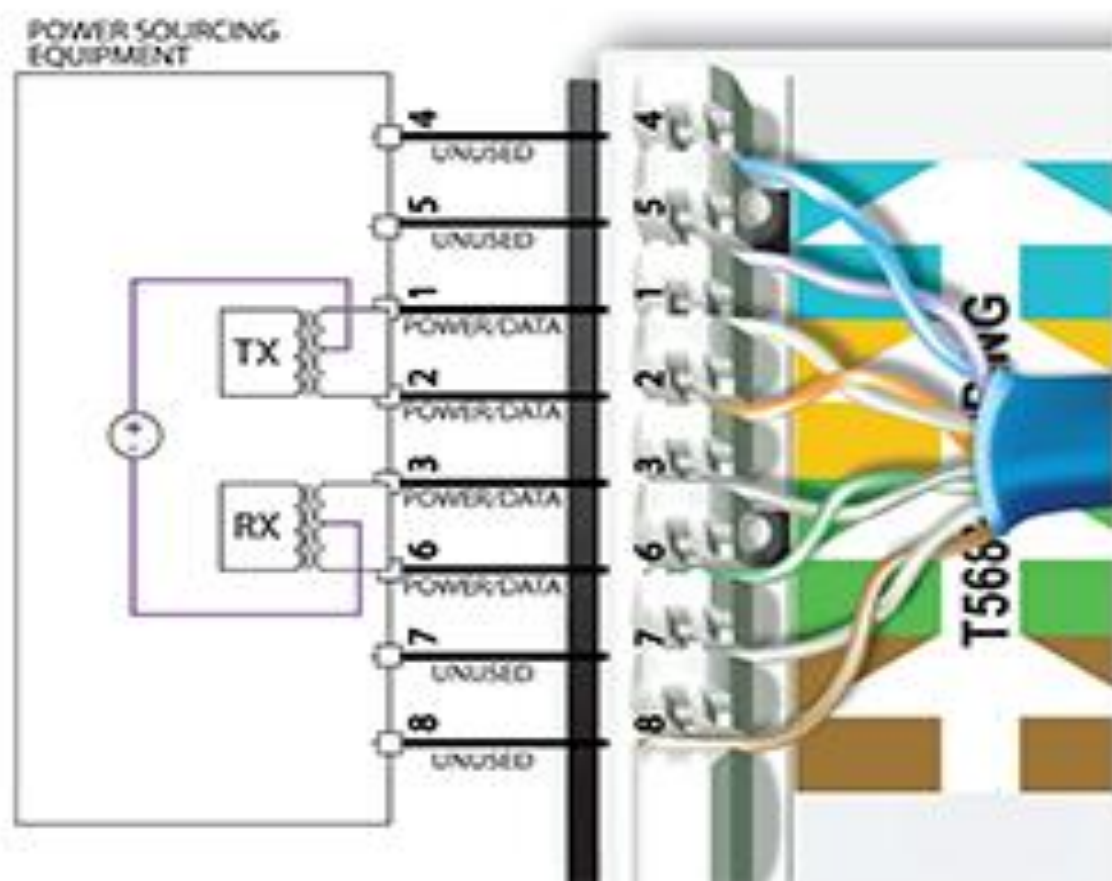
Wireless access points (WAPs)



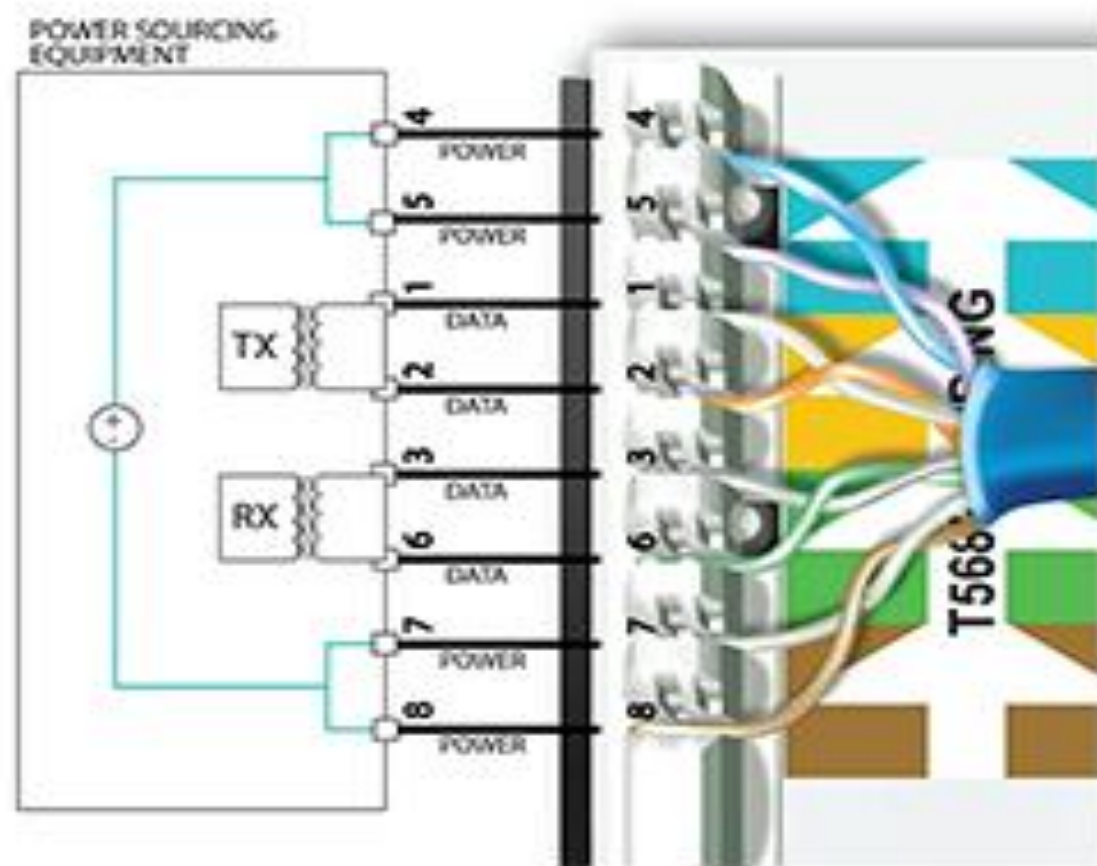
Pinouts

802.3af Standards A and B from the power sourcing equipment perspective (MDI-X)

Pins at switch	T568A color	T568B color	10/100 mode B, DC on spares		10/100 mode A, mixed DC & data		1000 (1 gigabit) mode B, DC & bi-data		1000 (1 gigabit) mode A, DC & bi-data	
Pin 1	 White/green stripe	 White/orange stripe	Rx +		Rx +	DC +	TxRx A +		TxRx A +	DC +
Pin 2	 Green solid	 Orange solid	Rx –		Rx –	DC +	TxRx A –		TxRx A –	DC +
Pin 3	 White/orange stripe	 White/green stripe	Tx +		Tx +	DC –	TxRx B +		TxRx B +	DC –
Pin 4	 Blue solid	 Blue solid		DC +	Unused		TxRx C +	DC +	TxRx C +	
Pin 5	 White/blue stripe	 White/blue stripe		DC +	Unused		TxRx C –	DC +	TxRx C –	
Pin 6	 Orange solid	 Green solid	Tx –		Tx –	DC –	TxRx B –		TxRx B –	DC –
Pin 7	 White/brown stripe	 White/brown stripe		DC –	Unused		TxRx D +	DC –	TxRx D +	
Pin 8	 Brown solid	 Brown solid		DC –	Unused		TxRx D –	DC –	TxRx D –	



Mode A



Mode B