Applying Power over 4 Pair Cable: Concerns and Customer Needs

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Objectives to Consider

- Economically provide power over a twisted pair link segment to a single Ethernet device.
  
  To be included:
  
  10BASE-T
  
  100BASE-TX.

  To be considered:
  
  1000Base-T

- Support current standard, 4-pair, horizontal cabling infrastructure for installed Cat 3 and Cat 5 cabling

- Not cause damage and interoperate with compliant RJ-45 MDI Ethernet devices
Places from which Power is Provided

- Device originating the Data signals (Switch)
  - New Switch/Hub ports required
  - Lowest Total System Cost
  - Lowest Rack Space Requirement
- Between the Switch and the DTE (Mid-Span)
  - Supports Legacy Switches, Hubs, and Routers
Ways to Provide Power

- **Signal Pair (Balanced)**
  
  Supports 2 Pair Cable Installations

  More difficult to provide a Mid-Span solution

- **Spare Pair (Balanced)**
  
  Requires 4 Pair Cable Installations

  Easier to provide a Mid-Span solution for 10/100Tx, but difficult when 1000Base-T is considered
Not Causing Damage to Legacy Devices

- Terminations on Existing 10BaseT or 10/100Tx DTE Devices are:
  - Generally Low Impedance (50-150 Ohms)
  - Low Power Tolerance (.25 Watts or Less)
- Other Devices use RJ-45s (e.g. Token Ring, PBX)
- These must be detected BEFORE the application of 5-15 Watts of Power
Interoperate with compliant RJ-45 MDI Ethernet Devices

- Agree on a common powering scheme for the DTE and the Switch and the Mid-Span
- Protect the Switch or Mid Span Device from Damage
- Define appropriate management objects for power capability and status
- Must discover a compliant device BEFORE power is applied