Applying Power over 4 Pair Cable: Concerns and Customer Needs

Karl Nakamura, Cisco Systems

karln@cisco.com

Cisco Systems

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**