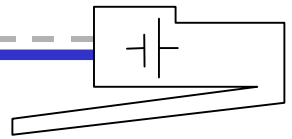
DTE Power via MDI

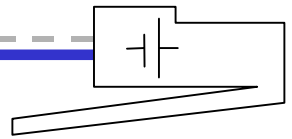
Study Group Plenary Meeting Report March 2000 Albuquerque, NM

Steve Carlson, SG Chair



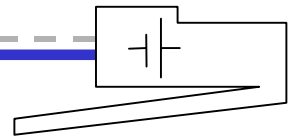
Meeting Goals

- Continue to define the constraints
- Examine and set bounds to the problem space



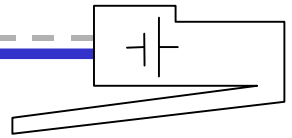
Meeting Goals

- Establish the list of decisions which must be made:
  - What information is needed to reach consensus?
  - How do we gather the required information management?
  - Is it possible to gather the required information in all cases or must “good faith” estimates be made?



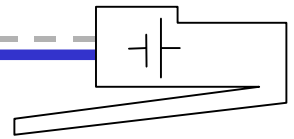
Presentations

- “LAN Magnetic Temperature Rise versus DC Bias”, Henry Hinrichs, Pulse Inc
- “BER vs. Transformer Current”, Mike Nootbaar, TDK Semiconductor
- “More on Stimulus and Unique Response”, Nick Stapleton, 3Com
- “Method for Powered DTE (PDTE) Authentication”, Amir Lehr, PowerDsine
- “Power over the DTE - A simple and low-cost proposal”, Daniel Dove, H-P



Presentations

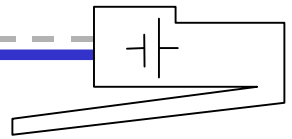
- “Power Delivery Calculations and Proposals” Robert Leonowich, Donald Stewart, Lucent
- “Power Delivery Mechanisms” Robert Leonowich, Donald Stewart, Lucent
- “Preliminary make/break underload testing”,Elwood Parsons, AMP
- “Power over the MDI”, Howard Frazier, Karl Nakamura, Roger Karam, CISCO Systems



New Presentations

- “DTE Powering System”, Arlan Anderson, Nortel Networks
- “Investigation of Sensing for DTE Power Via MDI”, Jennifer Rasimas, Stephen Jackson, Nortel Networks

- All meeting material is available on our Web site: http://grouper.ieee.org/groups/802/3/af/index.html



Objectives for DTE Power via MDI

(1) 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.

(2) Select one power distribution technique for world-wide use

(3) Not cause damage and interoperate with compliant RJ-45 MDI Ethernet devices including:

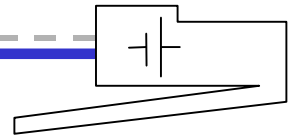
a. Switch- to- switch connections (both supplying power)

b. Cross- over cables

c. Common mode termination implementations

d. Shorted conductors, pairs or loop- back plug

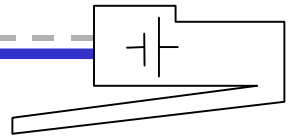
(4) Define a capability detection function that works with a powered and an unpowered device



Objectives for DTE Power via MDI

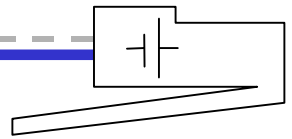
(5) Select the voltage, minimum and maximum current and wattage to be supplied
(6) Add appropriate management objects for power capability and status
(7) Support current standard, 4-pair, horizontal cabling infrastructure for installed Cat 3 and Cat 5 cabling
(8) Preserve the signal transmission and isolation characteristics of existing equipment and cabling
(9) Maintain normal functionality of Link Integrity Test function in legacy and new devices

(10) Consider mid-span power insertion, powering over the signal pairs, and interaction with other RJ- 45 interfaces: Token Ring, ATM, FDDI, TP-PMD, 1000BASE-T, ISDN, networking test equipment, PBX, IEEE P1394b, devices listed in ISO / IEC 11801 : 1995 Annex G



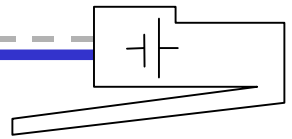
Decision List

- Maximum Voltage (Objective 5)
- Maximum and minimum current (Objective 5)
- Are classifications required, and (if so) how many (Objective 6)
- Detection to be made on same pair as power
- Which pair(s)? (Objective 7)
- What level of support for 2-pair legacy systems (Objective 7)
- Level of support for 1000BASE-T (Objectives 1 & 9)
- Determine fault behavior



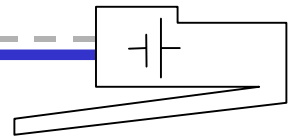
Decision List

- Determine type of discovery mechanism
- Single or multi-tiered discovery mechanism
- Of the known RJ-45 devices can we determine which can we live with?
- Level of support for mid-span insertion
- AC or DC
- Should we define a standard means to provide optional visual indications of the ability to supply power from a connector and/or is it currently providing power?



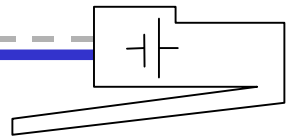
Decision List

- Maximum voltage not to exceed SELV per IEC 950



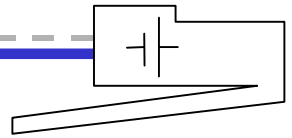
Additional Presentations

- “Wire Pairs at the Desktop DTE”, David Law, 3Com
- “802.3 Report to SC25/WG3 regarding DTE Power via MDI”, Geoff Thompson, Nortel Networks



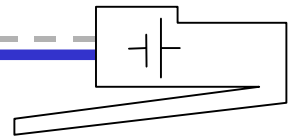
Motions

- Motion 1 - Without specifying the two and only two pairs to be utilized for DTE power, DTE power shall utilize two pair powering where each wire in the pair is at the same nominal potential and the power supply potential is between the two pairs selected.
- Moved: Michael McCormack
- Second: Henry Hinrichs
- Technical - 75% Required
- Yes: 23 Opposed: 4 Abstains: 3 Total attendance: 33 Time: 1:42 PM 1/21/00



Motions

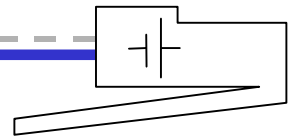
- Motion 2 - Regardless of the detection scheme adopted and the power feed scheme adopted, the power detection and the power feed shall operate on the same set of pairs.
- Moved: Michael McCormack
- Second: Dave Richkas
- Technical - 75% Required
- Yes: 31 Opposed: 0 Abstaining: 1 Total Attendance 33 Time: 1:47 1/21/00



Motions

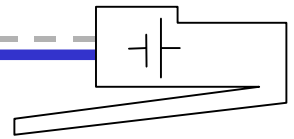
- Motion 3 - Regardless of the final voltage selected, the DTE power max voltage shall not exceed the limits of SELV per IEC 950.

- Moved: Michael McCormack
- Second: Nick Stapleton
- Technical 75% required
- Yes: 30 Opposed: 0 Abstain: 1 Total Attendance 33 Time 1:50PM 1/21/00



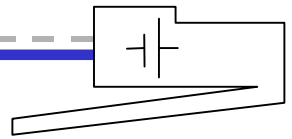
Action Items

- Previous Meeting
  - Would there be any false positive indications into a Token Ring RJ45 - No.
  - Would there be any damage plugging into a Token Ring RJ45 - No.



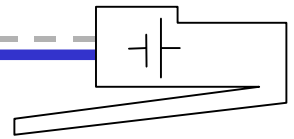
Action Items

- New
  - Determine the international limits for voltage/etc. safety and loop resistance limits - Geoff Thompson of Nortel
  - Set up a real test environment with an active load to determine the error characteristics of the MDI in relationship with the TIA cable spec. - Karl Nakamura, Cisco Systems; Mike Nootbaar of TDK.



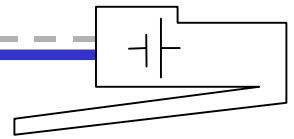
Action Items

- New
  - Isolation relative to 802.3, Telephony, Regulatory/Safety requirements. Dave Law of 3COM, Bob Bell of Cisco Systems.
  - Study the effect of AC on the MDI. Mike Nootbaar of TDK.
  - Provide experimental data on mid-span insertion on the signal pairs. (National Twister transceiver) Roger Karam, Cisco Systems.



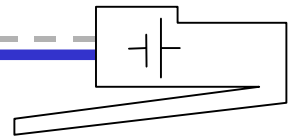
Action Items

- New
  - Contact Telecom Department at Texas A&M relative to the availability of wiring pairs at the desktop there and through the wiring industry group, determine a feel for the availability generally. Geoff Thompson of Nortel.
  - Strawman power supply specification which contains all critical parameters for consideration. Larry Spaziani, Texas Instruments.



Conclusions

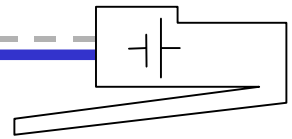
- Power will be supplied on either the idle pair or the data pair but not both
- The maximum voltage will be 60V DC (SELV)
- The discovery process must be robust in normal and under fault conditions
- Discovery must operate on the same pairs as the discovery process
- Maintain the differential characteristics of the link to minimize connector imbalance
- Power requirements are 8W min., 15W max.



Task Force Status

- PAR approved by NesCom (1/30/2000)

P802.3af (C/LM) Standard for Information Technology - Telecommunications and Information Exchange Between Systems - Local & Metropolitan Area Networks - Specific Requirements - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications - Data Terminal Equipment (DTE) Power via Media Dependent Interface (MDI)

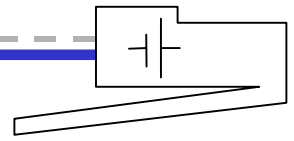


Task Force Status

The DTE Power via MDI Study Group has finished its work and is now the

802.3af DTE Power via MDI TF

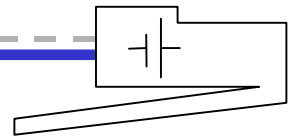
The Website address is now:
http://grouper.ieee.org/groups/802/3/af/index.html



Plans for the Week

The DTE Power via MDI TF will have its first meeting at the March Plenary.

- Goals for the week:
- Elect a chair, and editor
- Decide on:
  - voltage
  - current
  - pair usage
- Continue with constraints, discovery



Long Term Schedule