10GBASE-T
Cabling Ad Hoc

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10GBASE-T Cabling Ad Hoc - Scope of Work:

Scope:

- At the January 2003 10GBASE-T Study Group Meeting two ad hoc groups were created to develop system models in order to establish a uniform basis for comparing proposals.

- A group to develop channel models (chaired by Chris DiMinico) and a group for Matlab modeling (chaired by William Jones) was established.

- The 10GBASE-T cabling Ad Hoc is to provide the modeling Ad Hoc with cabling models based on measurement data.

Purpose:

Cabling models will be utilized by the modeling Ad Hoc to estimate channel capacity. The channel capacity results will be applied to demonstrate the technical feasibility of 10GBASE-T.

Ad Hoc Cabling Measurements

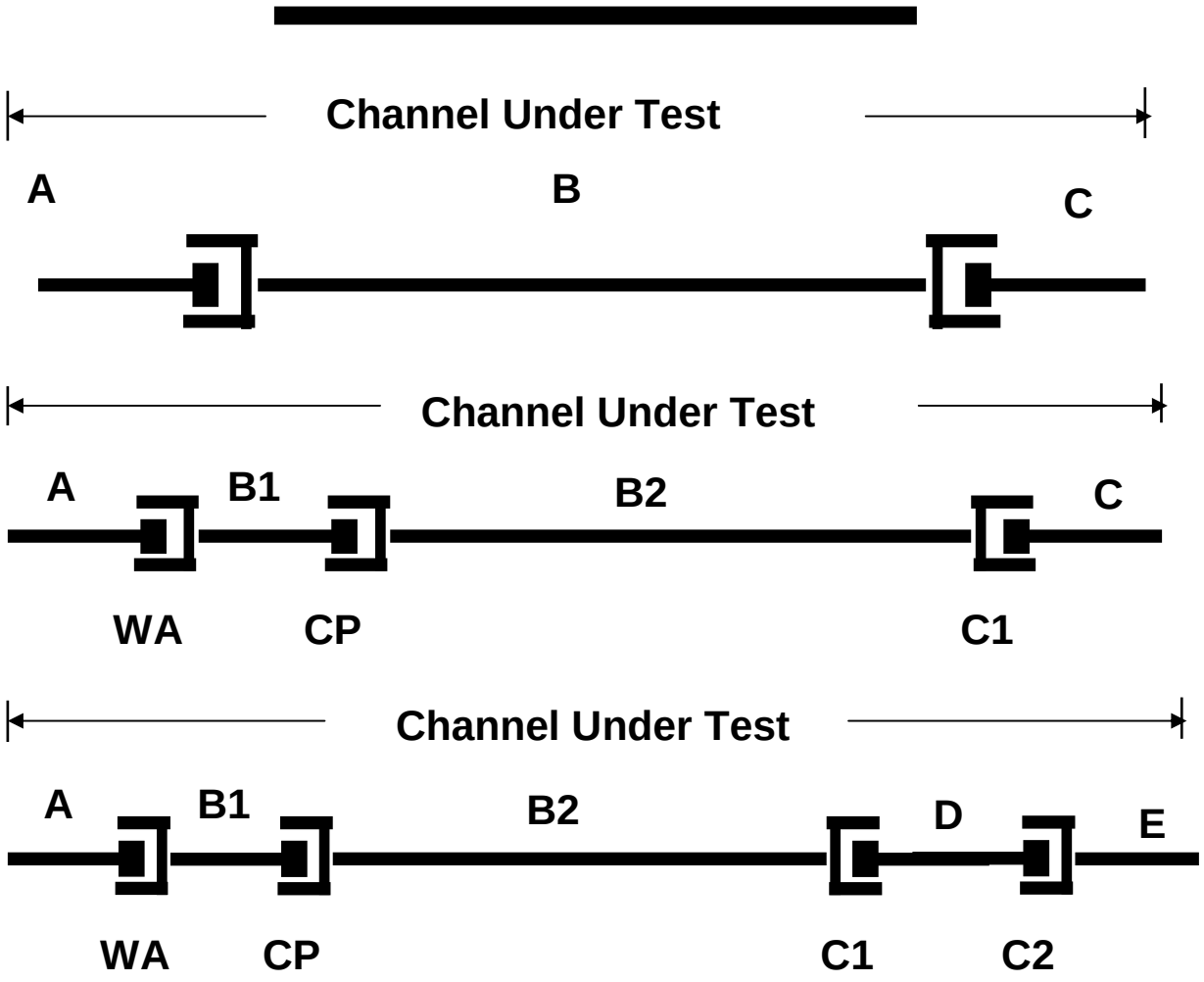
- **Measurement Data Collection for Modeling Task Group:**

  +**Class D and Class E channel characterization**
  +**(per ISO/IEC 11801 2nd ed) : Transmission parameters required.**

    – **Frequency characterization required: 1 MHz ≤ f ≤ 500 MHz**
    – **Frequency characterization optional: 500 MHz < f ≤ 1 GHz**

  +**Provide measured data exhibiting worst case relative to the limit**

Measurement Configurations



Measurement Model Parameters

1. Ad Hoc Measurement Data
2. 10GBASE-T Category 5e Models
3. 10GBASE-T Category 6 Models

- Insertion Loss
- Return Loss
- Pair-to-Pair NEXT
- Power Sum NEXT
- Pair-to-Pair ELFEXT
- Power Sum ELFEXT

TR42- Liaison - March 2003

The 802.3 working group of the IEEE LAN-MAN Standards Committee has initiated a study group to investigate 10 Gigabit Ethernet operation on 4-pair 100 ohm horizontal copper cabling as specified in ISO/IEC 11801 2nd edition. The initial frequency range of interest is: 1 MHz <= f <= 625 MHz. In addition, the study group is investigating alien crosstalk impairments. The study group would appreciate the assistance of TR42 in this effort. The information provided will be utilized in simulation modeling to validate the technical feasibility.

Alien Crosstalk Model

- **Measurement objectives -**

- **Develop Alien Crosstalk Limits based on measurement configurations that are representative of the installed cabling**

  - **conduit fill capacity**
  - **tie-wrap separation distances**
  - **patch cord mitigation**

- **Status: Model in development**

- **A number of experiments initiated**

Alien Next - Measurement Procedure

1. Lay-out seven 4-pair cables along a flat surface or supported in an aerial span.

   - Measure NEXT between all of the seven 4-Pair cable pair combinations
   - Mark measured end
   - Calculate Power Sum

2. Pull the seven 4-Pair cables into a conduit with a length of ≥ 30 meters; Size the conduit based on a 40% fill capacity (7 cables).

   - Measure NEXT between all of the seven 4-Pair cable pair combinations
   - Calculate Power Sum

3. Pull-out 5 meters of the seven meter 4-Pair Cables from the conduit and tie-wrap every meter.

   - Measure NEXT between all of the seven 4-Pair cable pair combinations
   - Calculate Power Sum