Use Case Summary

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IEEE 802.3bt, September 2014

Objectives

- **To compile a list of use cases that the task force will consider to meet its objectives**

- **For purposes of discussion, the uses cases have been divided into 3 categories:**
  - Channel Infrastructure
  - PSE & PD Configuration
  - PoE Application

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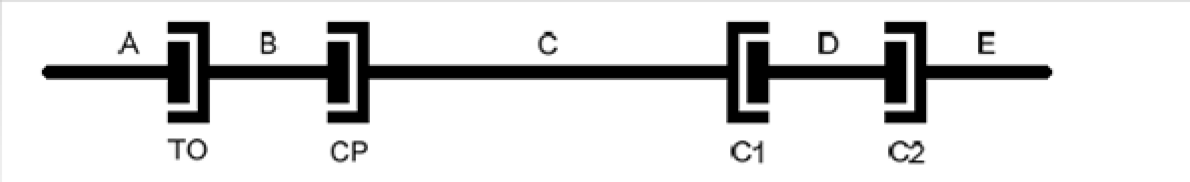
Channel Infrastructure

Contributor: Wayne Larsen



1. **0.15 meter channel with no connectors, made of patch cordage**
   – Only section D is present, and it's patch cable 0.15 m long.
2. **4 meter channel with 2 connectors, 3 m of horizontal cable and 1 m of patch cordage**
   – A and E are present and are patch cable each 0.5 m long. C is present and is horizontal cable 3 m long. Two connectors are present.
3. **23 meter channel with 4 connectors, 15 m of horizontal cable and 8 m of patch cordage**
   – A is a patch cable 1 meter long. B is a patch cable 5 meters long. C is horizontal cable 15 m long. D and E are patch cables 1 meter long. All four connectors are present.
4. **100 m channel with 4 connectors, 90 m of horizontal and 10 m of patch cordage**
   – A and E are patch cables 2 meters long. B and D are p-patch cables 3 meters long. C is horizontal cable 90 meters long. All four connectors are present.

Channel Infrastructure

Contributor: Ken Bennett

1. Short Channels: 2 cables 2 connectors, where:

- The 2 connectors are in the form of a Jack-Jack coupler, and
- The 2 cables are any combination of the following widely available lengths:
  - 0.5ft, 1ft, 0.5m, 3ft, 1m, 1.5m, 5ft, 6ft, 2m.
  - With wire gauges of 26, 24, (widely available) and 23, 22 (less common, but possible).

Notes

- Comments made by Sterling Vaden, chairman of TIA 42.7, the TIA subcommittee on Copper Cabling Systems
  - Comment #1
    Most likely composed of four shielded copper twisted pairs, with the similar overall diameter as Category 6A and Category 7A cables, the Category 8 cabling system under development also will use the popular modular RJ-45 style of connectors. ***The intention of the Category 8 standard is to be fully backward-compatible with the previous Category 6A and lower standards****.*
  - Comment #2
    Vaden says the obvious way to overcome cable insertion loss is to make the cable bigger. That's not likely to happen because there are a number of design considerations that restrict moving to larger cable conductors than those being manufactured now. Plus, in Vaden's view, using larger gauges would make the cable too big and bulky. ***Therefore, the practical gauge limit for copper, twisted-pair cables has, for all intents and purposes, already been established with Category 6A and 7A cables at a maximum of 22 AWG.***

Channel Infrastructure

Contributor: Yair Darshan

1. Minimum channel length that was used to define the channel characteristics per TIA-568-C.2 clause I.3.

ANSI/TIA-568-C.2

I.3 Return loss modeling results

A reasonable worst case channel configuration used to develop the return loss limits is shown in figure I.1. All flexible cable segments are assumed to have a asymptotic fitted characteristic impedance value of 95 Ω. The solid core cable segments are assumed to have a 105 Ω asymptotic fitted characteristic impedance. All connecting hardware is assumed to have return loss performance at the return loss limit for connecting hardware.

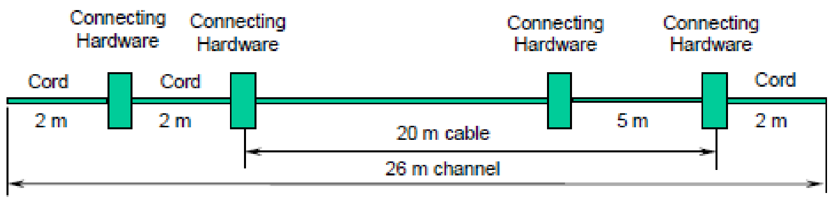


Figure I.1 - Modeling configuration

Reflections at the cable interfaces may result from characteristic impedance mismatches between cable segments or from the mismatch between connectors and cable segments. The phase dependencies and potential for in-phase addition of return loss between the different components in the channel are very much dependent on the physical separation of these interfaces from each other. Worst case in-phase addition most likely occurs in the frequency range from 15 to 30 MHz frequency range, where physical distances, typical for patch cords, match ¼ wavelengths. If distances between connections are multiples of a fixed low value, then it is possible, but unlikely, that the return loss will exceed the pass/fail limits for the channels or permanent links under the following conditions:

- In channels that use a cross-connect.
- In channels and permanent links which use a consolidation point.

In case, a return loss failure occurs in a channel:

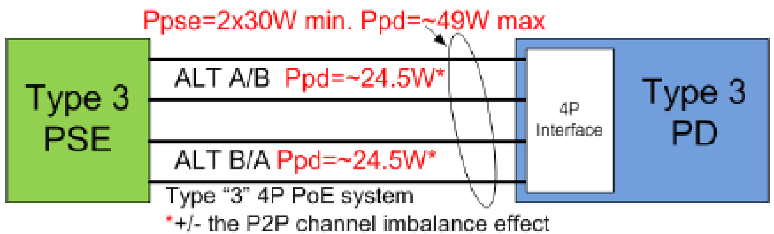
1 Verify the operation and calibration of the field tester.
2 Determine the source of major reflections.
3 Reduce the number of connectors in the channel.
4 Select components with better return loss performance.

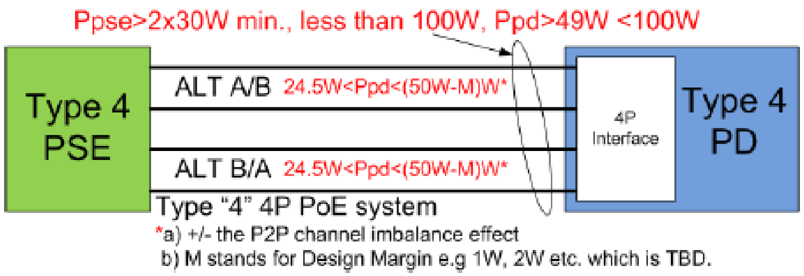
PSE & PD Configuration

Contributor: Yair Darshan

Type “3” and “4” New PSE and PD types for 4P-PoE

- New 4P PoE standard may consists of two new types:
  - Type “3” (Temporary type name): PDs with up to 49W and PSE to support it.
  - Type “4” (Temporary type name): PDs with >49W and less than 100W and PSE to support it.
- The above differentiation is required to allow system cost optimizations based on market and applications.





PoE Application

Contributor: Lennart Yseboodt, Matthias Wendt

1. **Powering professional LED luminaires with Power over Ethernet**
2. **Enable low standby applications**
   - Aim would be to allow a PSE-PD system to consume no more than 150mW, with 100mW consumed in the PD application. This gives a PSE-PD budget of 50mW inclusive of MPS. Measured at the Vpse rail.
   - This is mostly an implementation issue, but the standard should not mandate measures that require power in excess of this.
3. **PSE power ~= PD power**
   - Current 15% reserved power is too high for bulk lighting applications.
   - The standard must allow a tight match between PSE power reserved and PD power granted.
4. **Exploit performance options of engineered cable systems. Modern, properly done, cable installations allow PoE to reach higher performance (cost, efficiency).**
   - The standard should allow to exploit this when applicable.