Standards overview

Computer Network Cabling Standards

Engineering Standards and publication are designed to serve the general public through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvements of products and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need.

The standards are constantly evolving. The cabling standards are also no exception to it. In recent years there have been so many rapid developments in cabling technologies that the quality of today's cabling and connecting hardware far exceeds the best products available a few years ago. While the standards and technologies have evolved, the user is yet to be fully aware of all the developments that are taking place and this has left him bewildered. In the fear of obsolescence, he goes in for so called 'the latest' and ends up paying a high price for the performance which he either does not need or his network is incapable of delivering.

The standards organizations do not ease the matters either. Very regular the standards are revised, updated or rescinded. Various companies in order to be ahead of the competition, lay their quick claims on the release of the products which meet these latest revisions, either rightly or not. This scramble for the top slot keeps the market place in a state of confusion, and the end user in a helpless position. Thus a standards, instead of eliminating the misunderstanding, breeds it. This defeats the basic purpose of the standards.

Hence there is a need for removal of this misconception and educate the customer on various aspects of standards, the standards organizations, their scope, relevance to the applications, network requirements, desired performance and most important, the budget. The applicable standards are to be chosen after careful study and proper understanding of the subject.

This document describes the various prevalent standards, the parameters to be measured, standards organizations and its importance to the user.

The organisations and their standards

There are several organisations that influence the data cabling standards such as

Organisations	Standards	
ANSI EIA/TIA	568A/B	Commercial Building Telecommunication standard
CENLEC	EN 50173	Customer Premises Cabling for IT
ISO/IEC	IS 11801	Generic cabling for customer premises
IEEE	IEEE	LAN/WAN/MAN standards
ATM		Data communication protocol

Cabling Measurements

There are various measurements to be carried out on the cabling to ascertain its conformance to the specifications and standards. This is in addition to the tasting, which assures functionality and helps locating the faults. The various measurements to be carried out are:

a. Wiremap And Length
b. Delay And Delay Skew
c. Near End Crosstalk (next)
d. Power Sum Next
e. Fext And Elfext
f. Attenuation
g. Attentions To Crosstalk Ratio
h. Impedance
i. Structural Return Loss
j. Dc Loop Resistance

Before we look at the actual measurements to be carried out, it will be worthwhile to understand the basic definitions of the above terms:

a. Wiremap and length

Wiremap checks for point-to- point continuity of the installation. It is the most Important parameter since many properties depend on the pin configuration of the channel. Wiremap identifies the location of opens, breaks and pairs that are shorted. The various wiremap failures could be because of shorted pairs, split pairs and transposed pairs.

The measurement of length is important in a channel because of the pairs twists incorporated in cables. Hence a channel of 100m (max length), on measurement will be a little over the mark. The measurement takes into account the time required for the signal to traverse the entire length and the MVP (Nominal velocity of propagation) of the cable.

b. Delay

Dealy is a measure of time required for a signal to propagate from one end of the circuit to the other. It is usually measured in Nanoseconds. The worst-case Daly should not exceed 1 microsecond for a 100-meter length.

Delay skew

Delay skew is the difference between the propagation delay on the fastest and slowest pairs in a UTP cable. Delay skew is important because the high-speed network usually rely on all four pairs for transmission of information. If receiving end at different times thus making it impossible to reconstruct the original signal. The worst case skew shall be less thane 50 nanoseconds for a 100-meter length.

c. Near End Crosstalk (NEXT)

The cross talk occurs when an adjacent pair of wires picks up a strong signal on one pair of wires. NEXT is that portion of the transmitted signal that is electromagnetic ally coupled back into the received signal. The receiver may not be able to distinguish between the real received signal and the crosstalk noise.

Low crosstalk (desired) is a high number which menace difference between the magnitude of the transmitted signal and it associated crosstalk is very high it is necessary to measure NEXT at both ends of the cable as the results could be found to be greatly varying.