

INFRASTRUCTURE

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Test those patch cords

Analysis of wide variety of products reveals interoperability problems.

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Over the past few years, most LAN owners have become aware that at faster data rates patch cords have a huge impact on LAN performance, signal quality and channel through put. The Telecommunications Industry Association (TIA) even advises if there is a LAN problem, the first task to do is check the patch cords.

Recent testing on Category 5e- and Category 6-rated patch cords, however, obtained through open market channels, shows that 70% of Category 5e cords and 83% of Category 6 cords fail to meet the TIA published requirements.

Last year, the TIA issued the long awaited CAT 6 patch cord test procedure (TIA/EIA-568-B.2-1, Annex J). This test, however, requires a network analyzer, complex fixturing and is usually run in a laboratory environment. It is an effective cord test, but not intended for field or high-volume testing.

Most patch cord assembly houses could not afford the equipment or personnel to test cords, but they realized their customers could not test them either. Therefore, cords are usually only tested for continuity and wire mapping. Most distributors, installers and end-users make the assumption that if the cable used to make the cord is imprinted CAT 5e or CAT 6, the cord must also be, but this assumption may be wrong.

Now, end-users can purchase patch cord test adapters for use with their cable analyzers. This device enables a CAT 5e or CAT 6 cord to be tested to the full requirements of TIA/EIA-568-B, including propagation delay, length, delay skew, wire map, NEXT and return loss. A recent test program, conducted using a cable analyzer, and designed to replicate cord testing from an end-user or installer's perspective, uncovered some interesting results.

Before acquiring cord samples, interoperability was considered, which is fundamental to open specifications.

Although all CAT 5e components (including cordage) are typically interoperable, most CAT 6 premise hardware manufacturers currently offer end-to-end channel warranties contingent upon installing their own proprietary cords. The TIA's patch cord and channel requirements, however, are written around the principle of component interoperability; therefore, the test did not include any system-proprietary cordage, but rather cords available on the open market.

A total of 96 CAT 5e and 53 CAT 6 rated cords were tested. They were purchased from distributors, retail outlets, assembly houses and catalog houses. Whenever possible, 2-meter and 3-meter lengths were obtained, with three or four samples of each category. In some instances, however, specific lengths or performance categories were not available. In addition, the purchase price of a 2-meter cord was recorded to see if performance had any correlation to cost.

The CAT 5e cord testing results showed a 69.8% failure rate. Also, the failures were evenly distributed across all purchase channels. Put in a different perspective, this indicates that seven out of every 10 CAT 5e cords that an end-user purchases do not meet specification requirements.

CAT 6 cord requirements are relatively new and much more difficult; therefore, higher failure rates were anticipated, but not as drastic as was discovered. The data showed 83% of the CAT 6 cords tested failed. These cords are general-purpose patch cords meant for use in any CAT 6 channel, not sold as part of an end-to-end channel solution.

The cost of a 2-meter CAT 6 cord averaged \$6.50, with a variation from approximately \$1 from one assembly house, to almost \$20 at a retail outlet. All these lowest- and highest-priced cords failed, with many of the most expensive cords not meeting CAT 5e limits. Overall, there was no significant cost-to-performance correlation.

Many of the failing cords had damaged or deformed cable. Inconsistent assembly techniques and tightly coiled packaging were also observed throughout the failed cord samples. It appeared that most cord assemblers have not developed the processes to consistently manufacture CAT 5e or CAT 6 cords.

End-users have two options. They can follow the recommendations of their supplier, and only choose to buy approved cords that are designed to go with the installation specified, or they can test the cords themselves. The latter provides a means to check legacy cords, as well as verify incoming product to meet requirements consistency from cord to cord.

The patch cord test program shows that most open-market cords currently labeled Category 5e or Category 6 fail to meet the TIA's published requirements. This may be a result of the fact that until last year there was no published test method or requirements. Moreover, when the TIA did publish requirements and a procedure, it was not intended for field use.

Simple, accurate and cost-effective cord test capabilities now are available. Cord manufacturers can easily test and verify performance, distributors can demand it, installers can verify it, and end-users will get the performance for which they paid.

For more information from **Quabbin Wire & Cable:**

www.rsleads.com/306cn-253

For more information from **Fluke Networks:**

www.rsleads.com/306cn-254

For more information from **TIA:**

www.rsleads.com/306cn-255

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