

What's up with Category 6A?

For starters, the standard is likely to be approved for publication at the TIA TR 42.7 meeting in June.



What is augmented Category 6 cabling? The following seems like a simple question, but unfortunately, there is no simple answer. Augmented Category 6 or "Category 6A" cabling as it is called in the industry is still being refined as manufacturers study the intricacies of cabling and component performance.

There are some phenomena that are not well understood, namely the effect of pair balance and coupling modes on alien crosstalk performance. The result of this work should lead to better component designs with more available bandwidth and better noise immunity.

Also, a lot of work is happening to improve test fixtures and test procedures for more accurate and consistent measurements at high frequencies.

I attended the TIA TR 42.7 subcommittee meeting in Miami, Fla. recently and we went through the tough and grueling process of reaching consensus to resolve ballot comments on draft 5 of the standard.

It is a difficult process — a balancing act between what is achievable and what is practical. The result of the process is not the best nor the worst, but something in between — good enough, where everyone is equally unhappy, but prepared to accept the outcome.

So what is augmented Category 6 cabling? It is a generic cabling system that is specified up to 500 MHz with improved alien crosstalk isolation and improved transmission performance at high frequencies.

It is designed to support applications such as 10GBASE-T Ethernet in a worst-case 4-conductor topology for distances up to 100

metres. It includes an integrated set of channel, permanent link and component requirements that are built from the ground up to ensure that cabling performance is met under worst case conditions.

For example, Category 6A includes new alien crosstalk requirements for closely bundled "six around one" cabling configurations, much worse than what is normally encountered in the field.

These requirements are intended to be met by design thereby eliminating the need for alien crosstalk testing and mitigation practices in the field, which can be complicated

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and time consuming.

It is interesting to compare the performance of Category 5e, Category 6 and Category 6A channels for some key parameters.

The biggest difference in performance between Category 6A and Category 6 is in the alien crosstalk parameters, namely the Power Sum Alien Near End Crosstalk (PSANEXT) and the Power Sum Attenuation-to-Alien Crosstalk Ratio, Far End (PSAACRF). The PSANEXT for a 100-meter Category 6A channel is 13 dB better compared to the expected performance for a 55-meter Category 6 channel.

Also, the Insertion Loss is approximately 4 dB better at 500 MHz compared to the expected performance of a Category 6 chan-

nel, which is provided in TIA Telecommunications Systems Bulletin TSB-155.

This document, which was recently approved for publication should be available soon through Global Engineering Documents.

Larger cable diameter

To meet the tighter requirements for augmented Category 6 cabling, in particular the external alien crosstalk parameters and the internal high frequency transmission performance, requires some innovative enabling technologies.

Not all augmented Category 6 cabling solutions are created equal. The end user is encouraged to compare the different technologies to determine the available margins compared to standards, performance guarantees, space efficiency and installation practices.

An offshoot of the improved performance of Category 6A is a larger cable diameter. Most cables are in the range from 0.30 to 0.32 inches in diameter. This is an important consideration in the sizing of conduits and pathways.

As a final point I am often asked when the augmented Category 6 standard will be ratified.

Being close to the situation and recognizing the amount of work that remains to be done, I am optimistic that the standard can be approved for publication at the TIA TR 42.7 meeting in June of 2007.

This should coincide with the commercial availability of 10GBASE-T equipment, which is expected in the same timeframe. **CNS**

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Disclaimer: The information presented is the author's view and is not official TIA correspondence.