TESTS SHOW THAT CAT6 UTP CABLING CANNOT SUPPORT 10GBASE-T

Results from interference testing on high performance cabling systems and the recently available 10GBASE-T interface cards have indicated that unshielded twisted pair (UTP) Category 6 cable is seriously susceptible to electromagnetic interference (EMI) and Alien crosstalk.

Echoing Brand-Rex recommendations at least one major global electronics manufacturer advises that shielded cabling, and not unshielded, should be used for 10 Gigabit Ethernet networks.

Brand-Rex conducted tests with the application running on different types of cabling in an EMC chamber to the EMCD requirements and demonstrated that 10GBASE-T is susceptible to EMI when transmitted on UTP cabling. A leading active equipment manufacturer also supports this position and states that Cat 6A screened cable is needed for devices to pass the electromagnetic immunity requirements. Screened systems provide a greater degree of immunity to EMI than UTP systems.

EMI is not the only problem for Cat 6 UTP cable. In the initial stages of the 10GBASE-T standardisation process, the committees advised that Cat 6 UTP cable would support the new application on link lengths up to 37m or 55m, and further if the cabling was carefully managed to protect it from noise picked up from adjacent cabling (alien crosstalk).

Unfortunately, theory does not always reflect what happens in the real world. For example, if links are completely isolated to eliminate potential noise from one link to the next, Cat 6 UTP cable works. But if the patch cords and cables are bunched – as in practice they usually are – there are going to be severe problems.

This is supported by further recent testing carried out by Brand-Rex on 10GBASE-T devices – believed to be the first such tests in Europe – using various types of cabling, including Cat 6 and Augmented Cat 6 performance products. The results are clear: a distance of just 10m was difficult to achieve on Cat 6 UTP, unless the cabling was managed with special care.

As Brand-Rex's Technical Manager Ken Hodge says, many end users may be looking to install Cat 6 UTP systems, believing them to be future proof.

"Cat 6 UTP is an excellent platform for Gigabit Ethernet but it does not have the performance required to support 10GBASE-T. The bottom line is: if you are looking to implement a future-proof networking infrastructure you need to look at installing a higher specification product. Yes, there may be something of a premium to pay for a Cat 6A solution. But this will almost certainly be tiny compared with the costs involved if a Cat 6 UTP system is put in, and then soon has to be replaced."

In short, Augmented Cat 6 products are required to support the evolution of IT systems to 10GBASE-T and screened cabling is the best solution to install, particularly when there may be a risk of EMI.

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