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Industry News

Can copper wire match (or top!) fiber optic cable? This study suggests so

A technical paper from engineers at Penn State University claims that they have developed and simulation tested a copper wire transmission scheme for distributing a broadband signal over local area networks (LANs) at a rate of 10 G/bit per. Further, they claim it can be down with a lower average bit error rate than that of fiber optic cable that is 10 times more expensive.

A press release quotes the leader of the study, Dr. Mohsen Kavehrad, the W. L. Weiss professor of electrical engineering and director of the Center for Information and Communications Technology Research, as saying, "Our approach ... shows that copper is a competitor for new installations in the niche LAN market."

A paper by the Penn State team found that it was possible to meet the IEEE challenge to develop a system "for a next generation broadband copper Ethernet network capable of carrying broadband signals of 10 G/bit per second." To do so means a tenfold performance increase, one problem being that "at these higher speeds, some energy penetrates into the other wires and produces crosstalk." The Penn State scheme, the release said, avoids that problem "by using a new error correction method ... that jointly codes and decodes the signal and, in decoding, corrects the errors."

A MATLAB simulation, the release said, has shown that the scheme is possible and can achieve an average bit error rate of 10 to the minus 12 bits per second whereas fiber optic cable typically achieves 10 to the minus nine, it said.

The project, the release said, "receives support from Cisco, Tyco, Nexans and the International Copper Association."

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