Team in Denmark breaks data transmission rate over single fiber cable—43 terabits per second

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A team at Denmark's Karlsruhe Institute for Technology has broken the data transmission rate record previously set by a team in Germany (32 terabits per second). In this new effort, the team (with the High-Speed Optical Communications Group) achieved a rate of 43 terabits per second using just one laser and one fiber cable.

The researchers note that increasing transmission rates for digital data is becoming increasingly important as the Internet continues to grow at a blazing pace. They also note that the Internet infrastructure has been found to contribute to more than two percent of global emissions of carbon dioxide. This suggests, they note, that if higher transmission rates are not achieved, Internet related activities will contribute an increasingly larger share of global emissions and associated planetary warming. To prevent that from happening, more data needs to be sent over the same number of lines as exist today (or better yet, fewer).

In their announcement describing their achievement, the team notes that they have also in the past achieved transfer rates of 1 petabit (1000 terabits) when using multiple (hundreds) of lasers.

To break the record, the team used a new type of fiber cable developed by Japanese telecom giant NTT—instead of a single glass core, the new cable has seven. Data is sent over the fiber from a single laser, which means the signal must be split prior to transmission and then reassembled once received.

For a bit of perspective, sending 43 terabits of data in one second would be like backing up the contents of five full 1 TB hard drives—in just one second (excluding reading, writing, etc., of course).

Internet users shouldn't get their hopes up just yet, however, there is still more research to be done on higher rate fiber transfer, and once that happens, the international standards body will have to pick a winner, and then, hardware makers will have to create new hardware—all of which means, it's likely to be a while before such fast transfer rates make it to the Internet backbone, much less our individual devices.

The achievement by the team has been verified by an independent group and their findings have been detailed and presented as a "post-deadline paper" at the International Conference CLEO 2014.