Meeting the future demand for high-quality, high-capacity Internet

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(Phys.org)—Could you use a broadband service that is two thousand times faster, but costs you the same? A revolutionary "future-proof" technology, first proposed by Bangor University, is the front-runner in satisfying future demand for dramatically increased internet speeds and capacity.

The technology, which would use current optical internet cabling, has proven its ability to increase broadband transmission by up to two thousand times the current speed and capacity. To illustrate, that would mean downloading 20 feature length films in one second.

There are, of course, far more practical and wide ranging uses for this capability- uses which the market is increasingly demanding- such as 3D-TV, HDTV, social websites, on-line gaming, video sharing, video on demand and e-health, as well as applications yet to be created. End-user's demand for transmission bandwidth is already increasing by over 70% year on year.

Professor Jianming Tang, of Bangor University's School of Electronic Engineering and a leading scientist pursuing the new technology explains: "The technology, Optical Orthogonal Frequency Division Multiplexing (OOFDM), has unique and inherent advantages including, for example, the fastest transmission speed and highest cost-effectiveness compared to all existing technologies, great system flexibility and excellent performance robustness."

The current problem lies with existing access networks. Capable of offering less than 100Mb/s per subscriber, these have become the 'bottlenecks' to achieving the ultra-wide bandwidths required in the near future. And the solution lies in the networks and the technology they employ.

Bangor University is leading a three-year project to develop world-first commercially-exploitable smart OOFDM modules and network prototypes, using low-cost off-the-shelf components. This is based on the University's unique technical "know-how" in experimentally demonstrating end-to-end real-time OOFDM transceivers.

Prof Jianming Tang added: "Compared to today's commercially available broadband connections, the technology is expected to provide end-users with both downloading and uploading speeds up to 2,000 times faster than current speeds and with a guaranteed quality of services at a price that subscribers are currently paying for their current 20Mb/s services, regardless of subscribers' home location. Obviously, this will revolutionise communication technology".

The technology is also capable of significantly saving the network installation and maintenance cost for both service providers and equipment vendors. This is achieved by using currently installed fibre networks, but its 'intelligent' systems allow greater resistance to imperfect fibre systems and low-quality components. The system allows for the use of cost effective technical strategies; there is a significant reduction in network architectures; and 'central office' bypass and convergence of various networks of different architectures. It also provides a "Green" solution due to the significant reduction in electrical power consumption.

More information: Optical orthogonal frequency division multiplexing (OOFDM):

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Provided by Bangor University