

Australia has the fastest internet record in the world

An Australian team of researchers successfully tested a world record data rate of 44.2 Terabits per second (Tbps) from a single light source.

Published in the prestigious *Nature Communications* magazine, the research will not only be able to accelerate Australia's 25 years of telecommunications capacity, but it will also enable new technology models to be deployed worldwide. The technology is capable of supporting high-speed internet connections for 1.8 million Melbourne households (Australia) at the same time as billions of people around the world at peak times. According to content delivery service provider Akamai, the average broadband speed in Australia is about 11 megabits per second (1 terabit is equivalent to 1 million megabits). So the new 44.2 Tbps connection is 4 million times faster than the average speed of 11Mbps.

Usually such large-scale tests are limited to the laboratory. But in this case, the researchers achieved a record line speed using the existing communication infrastructure, so they could effectively test the load capacity of the line.

Researchers including Dr. Bill Corcoran (Monash University), Professor Arnan Mitchell (RMIT University) and Professor David Moss (Swinburne University) have used a new device to replace 80 lasers with a microchip - comb single, smaller and lighter than existing telecommunications equipment. It integrates and tests load capacity with existing infrastructure systems, similar to the infrastructure used by Australia's National Broadband Network (NBN).

It is known that this is the first time a micro-comb chip has been tested practically and transmitted the highest amount of data from a single optical chip.

To illustrate the ability of micro-comb optical assemblies to optimize communications systems, the researchers installed 76.6 km of 'dark' fiber connecting the campus of RMIT University in Melbourne City and Monash University. The optical fibers are provided by the Australian Academic Research Network Company (AARNet). In these fibers, the researchers placed a micro-comb device - provided by Swinburne University, that acts like a rainbow made up of hundreds of high-quality infrared lasers from just one chip. Each 'laser' acts as a separate communication channel.

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