

Scientists invent revolutionary chipset for high-speed wireless data transfer

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Here is a new microchip that can transfer data the size of 80 MP3 song files (or 250 megabytes) wirelessly between mobile devices, in the flick of a second. Or how about transferring a typical 2-hour, 8-gigabyte DVD movie in just half a minute compared to 8.5 hours on Bluetooth?

Such unprecedented speeds on the wireless platform are now a reality as scientists from the Nanyang Technological University (NTU) and A*STAR's Institute for Infocomm Research (I²R) have developed a revolutionary [microchip](#) that can transmit large volumes of data at ultra-high speeds of 2 Gigabits per second (or 1,000 times faster than Bluetooth).

The chipset employs wireless millimetre-wave (mm-wave) technology to transmit large packets of information while consuming little power. This enables low-power applications, like smart phones and tablets, to transmit/receive data between platforms, like projectors and TVs, without the need for cables for the very first time.

"The demand for ultra high-speed wireless connectivity has fuelled the need for faster data transfer rates. Unfortunately, current technologies are unable to meet these stringent demands. The NTU-I²R team, being at the cutting edge of research and development, has successfully demonstrated an integrated 60GHz chipset for multi-gigabits per second wireless transmission," said Professor Yeo Kiat Seng, the Principal Investigator of the project and Associate Chair of Research at NTU's School of Electrical & Electronic Engineering.

How the VIRTUS chipset works

Named the VIRTUS chipset, it consists of three components: an antenna, a full radio-frequency transceiver (developed by NTU) and a baseband processor (developed by I²R). The antenna is connected to the transceiver, which filters and amplifies the signals. It then passes the signals to the baseband processor, which comprises non-linear analog signal processing and unique digital parallel processing and decoder architecture – key to lower power consumption.

The team of scientists from NTU and I²R is the first in the world to successfully put together an integrated low-power 60 Gigahertz (GHz) chipset solution consisting of the three components, making it one step closer to commercialisation. It is also the first team to demonstrate one of the technology's applications – in the form of a high-definition wireless video stream.

The VIRTUS chipset has garnered 16 international patents. It has also been featured in 51 top-tier international journal and conference papers, on top of its other international accolades such as two best paper awards and two best chip design awards.

"This ground-breaking mm-wave integrated circuit (IC) technology will have significant commercial impact, enabling a wide range of new applications such as [wireless](#) display, mobile-distributed computing, live high-definition video streaming, real-time interactive multi-user gaming, and more," added NTU's Prof Yeo, who is also founding director of NTU's VIRTUS IC Design Centre of Excellence.

The collaboration, which began in December 2009, was funded by A*STAR's technology transfer arm, Exploit Technologies Pte Ltd. The team has been approached by leading players and global brand names in the electronics and semiconductor industry to develop the chipset

commercially. It will also showcase the technology at a leading technical innovation event in June this year – Computex (Taiwan).

Provided by Nanyang Technological University

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