

Moving Copper into the Gigabit Era

G-FAST
SUMMIT 2014



G-fast 2014: Moving Copper into the Gigabit Era

The International Telecommunications Union (ITU) has taken the first steps towards standardizing **G.fast**, the next major DSL-based standard which vendors hope will provide a «fibre-like» experience. As an **FTTH** alternative, operators have chosen to lay out fiber to the distribution point (**FTTDP**) and reuse existing access media, such as telephone lines and coaxial cables, to provide ultra-high-speed broadband access. Because the last-part transmission was over such a short distance, the operators anticipated they could achieve **gigabit speeds using existing access media**. G.fast technology has been developed to address this last-part transmission issue.

Vectoring Noise Cancellation

In order to work successfully, G.fast must be capable of ultra-high speeds, which entails extending the frequency spectrum. **VDSL2** currently works on 17 MHz or 30 MHz. G.fast technology will use the 106 MHz frequency band in the initial stage and 212 MHz in the future. However, higher frequencies also mean shorter transmission distances, higher costs, and greater power consumption. The frequency band that is ultimately used is a compromise between performance, costs, and implementation.

Similar to VDSL2, G.fast performance is affected by crosstalk between lines. Without the vectoring noise cancellation process, G.fast rates are severely degraded. Some lines are indeed capable of up to 1.3 Gbit/s. If crosstalk is present and vectoring processing is absent, the G.fast rate drops sharply to about 200 Mbit/s. This occurs because G.fast operates at a very high frequency and the impact of crosstalk on G.fast is much more severe than on VDSL2. Therefore, G.fast must use a more advanced vectoring technology to cancel crosstalk between lines.

Recent trials at Telekom Austria using prototype technology from Bell Labs confirm the value of Vectoring 2.0. Tests of G.fast on a good quality cable achieved aggregate speeds of:

- **1.1 Gb/s over a single pair of 70 m lines**
- **800 Mb/s over a single pair of 100 m lines**

Tests on the older, unshielded cables found in many buildings in Austria achieved speeds of 500 Mb/s over 100 m when a single line was active. However, when a second G.fast line was added, crosstalk dropped G.fast speeds from 500 Mb/s to just 60 Mb/s. G.fast with prototype Vectoring 2.0 technology removed the crosstalk and brought the speed back up to 500 Mb/s over 100 m.

A Self-install Technology

A key aspect will also be that G.fast wants to be a self-install technology, meaning the consumer kit should simply plug into existing comms connections in the home, without the need for operators to install anything new. A first version of G.fast, a 106 MHz wide profile, will be approved in 2014. That will then pave the way for interoperability testing before chipsets become available and manufacturers get busy on equipment. That would enable kit to ship in 2015.

What is G-fast standard current profile?

What are the main technological issues still to be solved?

What has been learned from recent tests and trials?

What are the first prototypes?

Responses will be delivered during the G-Fast Summit, to be held in **Novotel Convention & Wellness Paris Roissy CDG, from 20 to 22 May, 2014.**



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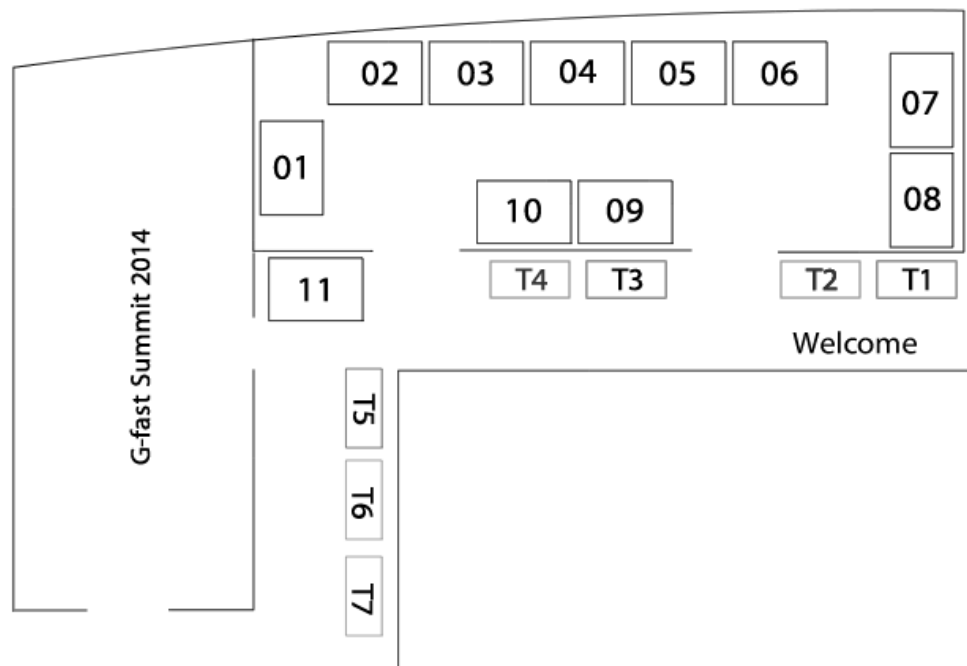
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