



**Fibre to the Home**  
**Council Middle East**  
**& North Africa**

**Enhancing Life**

# **THE G.FAST POSITION PAPER**

## **FOR FTTH COUNCIL MENA**

**TECHNOLOGY & TRAINING COMMITTEE**

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## INTRODUCTION

*G.fast is an evolution in copper technology modulation & error correction & cross talk noise reduction that boosts throughputs and speeds for last mile deployments*

*FTTH council MENA is taking a closer look at this solution to find applications to extend the reach of FTTH deployment especially in the drop section.*

*This papers takes a look at G.Fast and describes the solution as extension to Fiber in access*

*This paper is part of a concerted effort with other councils to harmonize the position versus some new copper developments like G.fast that serve as an extension of deep fiberization.*

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## INTRODUCTION TO G.FAST

**G.fast** is DSL technology for a loops shorter than 500 m, with performance targets between 150 Mbit/s and 1 Gbit/s, depending on loop length. Very high speeds are only achieved over very short loops. Formal specifications have been drafted as ITU-T **G.9700** and **G.9701**, with approval of G.9700 granted in April 2014 and approval of G.9701 granted on December 5<sup>th</sup>.

In G.fast, data is modulated using (DMT) modulation, G.fast modulates up to 12 bit per DMT frequency carrier, reduced from 15 in VDSL2 for complexity reasons.

The first version of G.fast specifies 106 MHz profiles, with 212 MHz profiles planned for future like 8.5, 17.664, or 30 MHz profiles in VDSL

The (FEC) scheme uses Trellis coding and Reed Solomon coding similar to that of VDSL2.

Performance in G.fast systems is limited to a large extent by crosstalk between multiple wire pairs in outside plants. Crosstalk cancellation called vectoring has also been developed for G.fast.

G.fast technology makes gigabit-level aggregate bit rates possible by adding spectrum to copper lines. VDSL2 lines use spectrum up to 17 MHz. G.fast widens this spectrum to 106 MHz. Anticipated amendments will use frequencies up to 212 MHz and take bit rates to 1 Gbps and beyond.

The high frequencies of G.fast can't be sustained over long distances. The best approach is to use a mix of technologies. G.fast is ideal for applications that bring fibre closer to the home and use very short copper loops to cover the last few meters.

## FTTH USES G.FAST TO EXTEND THE LAST MILE

The G.fast solutions used as fibre extensions can achieve the following objectives:

- Provide the sensation of fibre by extending speed over the last meters of existing copper infrastructure.
- In some particular cases, reduce CAPEX by deferring the cost of extending fibre to every building and home.
- Extend ultra-broadband to locations where fibre deployment and civil works are difficult
- In some cases reduce the need to enter and rewire homes and buildings
- Add flexibility to FTTH deployments and deliver high bit rates more time effectively.

Various operators would like to use FTTH to deliver ultra-band to the building assisted by G.Fast to the apartment.

In some locations are hard to reach through with fibre and make use of existing copper laid.

The effort required to trench the drop cable and rewire households may add complexity and cost.



New G.fast technology helps minimizing barriers for FTTH deployment and clears the path to ultra-broadband.

### G.FAST as FIBER EXTENSION SCENARIOS



FTT-FRONTDOOR



FTT-FLOOR



FTT-POLE/MANHOLE



FTT-BUILDING

- Deploy FTTH, but avoid entering the home
- Reduce cost of FTTH deployment
- Requires single-port DPU
- No cross-talk = no vectoring needed
- Typically reverse-powered by 1 user

- Deploy fiber closer to the subscriber
- Boost speeds beyond FTTN
- Requires multi-port DPU
- Cross-talk = G.fast Vectoring required
- Typically reverse-powered by all users

Because it works on short copper loops, G.fast must be deployed as an extension to fibre rollouts. FTTH operators can use the passive optical network (PON) to backhaul G.fast-enabled ONTs. And traditional operators can use G.fast to increase bit rates without having to extend fibre all the way to the home.

G.fast can deliver value in many different deployment scenarios, including:

- **Front door application FTdp** – decrease cost in the case where charges are applied for installing fibre in the home. In some other cases, fibre installation in the homes is provided to households without extra charges to stimulate subscription and increase take rate.
- **Distribution point** application– Bring more bandwidth to more people by deploying micro-nodes close to residences
- **FTTB-MDU** – Cut deployment costs by connecting individual living units in the case where copper infrastructure is available.

## FTTH COUNCIL MENA POSITION

FTTH Council MENA agrees that used with the purpose of encouraging FTTH/B deployment, G.Fast will achieve growing momentum in such deployments through the second half of 2015 and beyond.

The FTTH Council MENA does not regard G.fast as competitive technology for Fibre to the Home but rather as a complementary solution to extend fibre reach with practical benefits, particularly for *Fibre to the Door* and *fibre to the Floor* and as well as *fibre to the Building*.

Please note that fibre to the Curb is not consistent with FTTH Council MENA recommendations.