**Note to Technical Editors:** **G.fast features and timeline**

# *Answering to business strategy requirements*

G.fast delivers high-speed broadband access over copper telephone wires, operating on lines up to 400-metres long

* G.fast enables service providers to capitalize on existing infrastructure, achieving fibre-like speeds without rewiring urban areas already equipped with copper.

Customer self-installation

* Despite G.fast’s leap forward in sophistication over DSL access technology, it maintains the installation simplicity of ADSL. G.fast customer equipment, in line with that of ADSL, will arrive in a box containing only a G.fast-compliant modem and dongles to protect telephones.

‘Zero touch’ operations, administration and management

* Upgrading a customer to G.fast does not require the deployment of a technician to a customer premises or capable distribution point to effect the switchover.
* This remote management of user connections will simplify migrations to G.fast, and the standard’s coexistence with VDSL2 offers service providers the ability to switch customers between the two standards as business operations demand.

Coexistence with xDSL

* G.fast’s spectrum compatibility with VDSL2 enables service providers to play to the strengths of each standard in different environments.

Complements fibre to the home (FTTH) strategies

* In ‘greenfield’ scenarios, service providers will opt for FTTH.
* In ‘brownfield’ scenarios – for example, an urban environment with an abundance of copper telephone wiring – G.fast will be more cost-efficient than FTTH.

The deployment advantages of the FTTdp architecture

* A key benefit of FTTdp is that the distribution point unit (DPU) typically serves 1-20 lines, making it compact enough to place on a pole, in a small underground enclosure or in a small pedestal.

***Answering to service provider requirements***

Low power, cost and complexity

‘Zero touch’ operations, administration and management

Support for both TR-156 and TR-167 Broadband Forum architectures

Service rate performance targets

* 500-1000 Mb/s for FTTB deployments at less than 100m, straight loops
* 500 Mb/s at 100m
* 200 Mb/s at 200m
* 150 Mb/s at 250m
* Aggregate service rates of equal to or more than 500 Mb/s with start frequency of 23 MHz and VHF and DAB bands notches

Capitalizes on the advantages of FTTH and DSL

* FTTH bit-rates, with the customer self-installation of DSL
* Complements FTTH, and enhances fibre to the cabinet (FTTC)

Coexistence with xDSL

* Spectrum compatibility: G.fast operates at higher frequencies than VDSL2 (start frequency: 2.2, 8.5, 17.664 or 30 MHz)

Reverse power feeding (RPF) for the DPU from the customer premises

* Persistent Management Agent (PMA) acts as management proxy in the event of the DPU losing power

Control of upstream/downstream asymmetry ratio

* Flexible up/down data rate allocation
* Mandatory: 90/10 and 50/50
* Optional: from 50/50 to 10/90

Operates up to 106 MHz

* Maximum power spectral density (PSD) much lower than in VDSL2
* Configure PSD mask (e.g. start above VDSL2)
* Configure RFI/IAB notches (e.g. notch FM band)

Improved robustness

Uses Time Division Duplexing (TDD)

* Can easily vary upstream/downstream asymmetry ratio
* Easily supports low-power states
* Discontinuous mode allows trade-off between power consumption and user data throughput
* Point-to-point distribution

Mandatory support for vectoring

* Far-end crosstalk (FEXT) cancellation

PHY layer retransmission

* Mitigating the effects of impulsive noise while maintaining low latency

Supports Fast Rate Adaptation (FRA)

* Quickly adapts to changing channel or noise conditions

***Timeline: Standardization, testing and certification of G.fast systems***

***Standards Development***

January 2011:

At request of the Broadband Forum, ITU’s Standardization Sector (ITU-T) issued a call for papers on the transceiver aspects of FTTdp, resulting in the initiation of the G.fast project.

4 April 2014:

Approval of Recommendation ITU-T G.9700 “Fast access to subscriber terminals (FAST) - Power spectral density specification”, a specification to ensure that G.fast systems will not interfere with broadcast services such as FM radio.

5 December 2014:

Approval of Recommendation ITU-T G.9701 “Fast access to subscriber terminals (FAST) - Physical layer specification”.

First-half 2015:

Expected approval of G.9701 Amendment 1, providing an extended set of features for G.fast, which will include performance enhancements such as additions to its range of low-power states.

***Testing and Certification***

The Broadband Forum’s operator survey found strong support for a G.fast certification programme available to the industry before deployments take off, with interoperability as a top priority.

The Broadband Forum has initiated the development of a G.fast certification test plan (ID-337) and programme, and has chosen the University of New Hampshire InterOperability Laboratory as its Certification Test Lab.

Beta-trial of the G.fast certification programme planned for mid-2015

* first plugfest planned for the end of January 2015

The G.fast certification test plan tests one DPU/CPE combination for interoperability

* Functional, performance, stability, throughput

The University of New Hampshire InterOperability Laboratory will certify G.fast DPUs and CPEs independently

* Based on criteria defined by the Broadband Forum, e.g., how many counterparts to interoperate with, etc.

***Certified G.fast implementations expected before the end of 2015***