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UK Interoperability Standards

Open Forum 2017



8th November 2017



NICC DSL TG



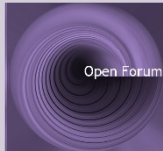
NICC DSL Task Group – A year in review

Kevin Foster CEng. FIET
NICC DSL Task Group Chairman

8 November 2017



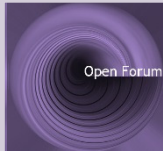
NICC Standards Limited



Outline

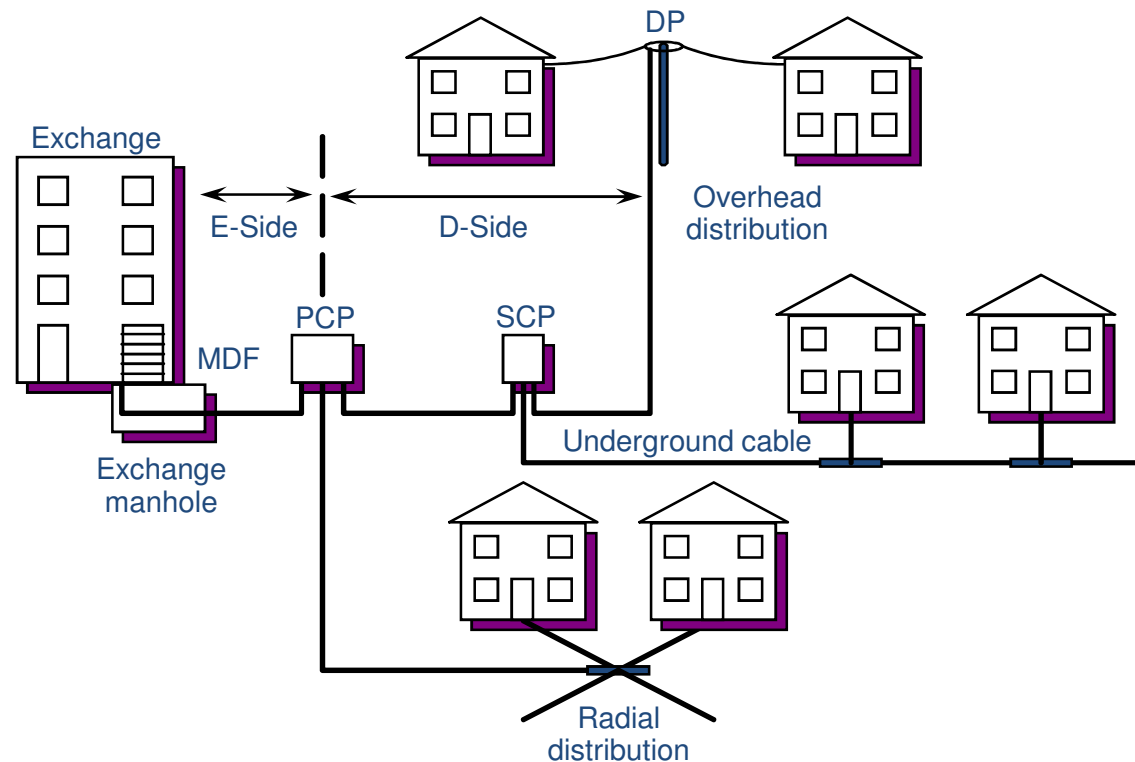
- Scope of DSL Task Group
- Participants
- Current work and deliverables
- Outlook for 2018
- Summary





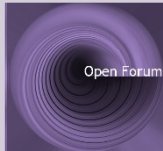
Specifications and guidelines relating to **Digital Subscriber Line** technology in the unbundled UK metallic access network

- BT
- KCOM



Key documents are the Access Network Frequency Plans and Metallic Path Facility specifications and guidelines

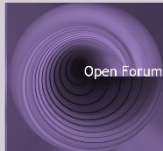




- 9 meetings in the last year
 - 5 Face-to-face meetings hosted by a NICC member
 - 4 Teleconferences

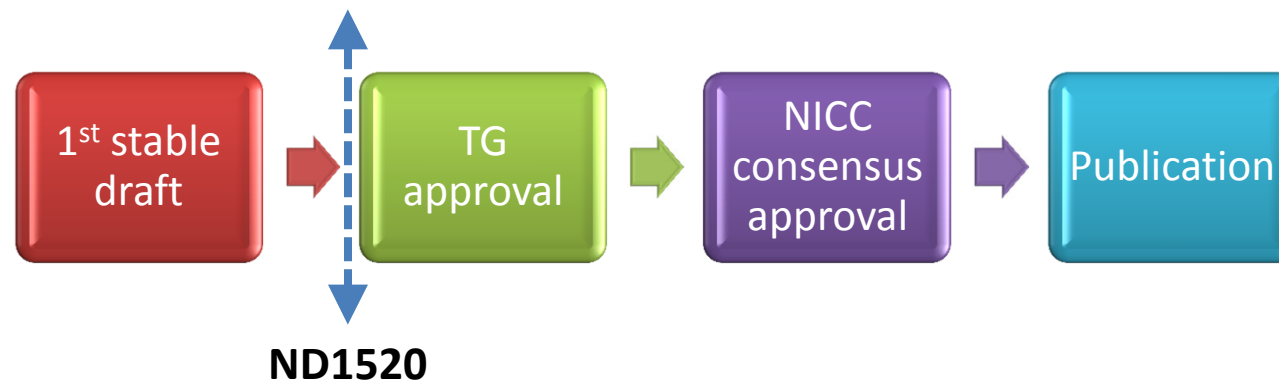
Operators/CPs	Equipment/chip vendor	Other organisations
BT Group (inc. Openreach)	ASSIA	Ofcom
Sky	ECI	
Talk-Talk	Huawei	
Vodafone	Intel	
	Nokia	
	Sckipio	

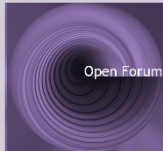




Work in progress

Work Item #	Description	Target ND	Status
321	Overlapping spectrum study and change to BT ANFP and BT ANFP Guidelines	Study report ND1520 and then uplift ND1602 and ND1405	Complex study work nearing completion looking at technical options for giving more low-frequency spectrum to G.fast whilst limiting impact to VDSL2

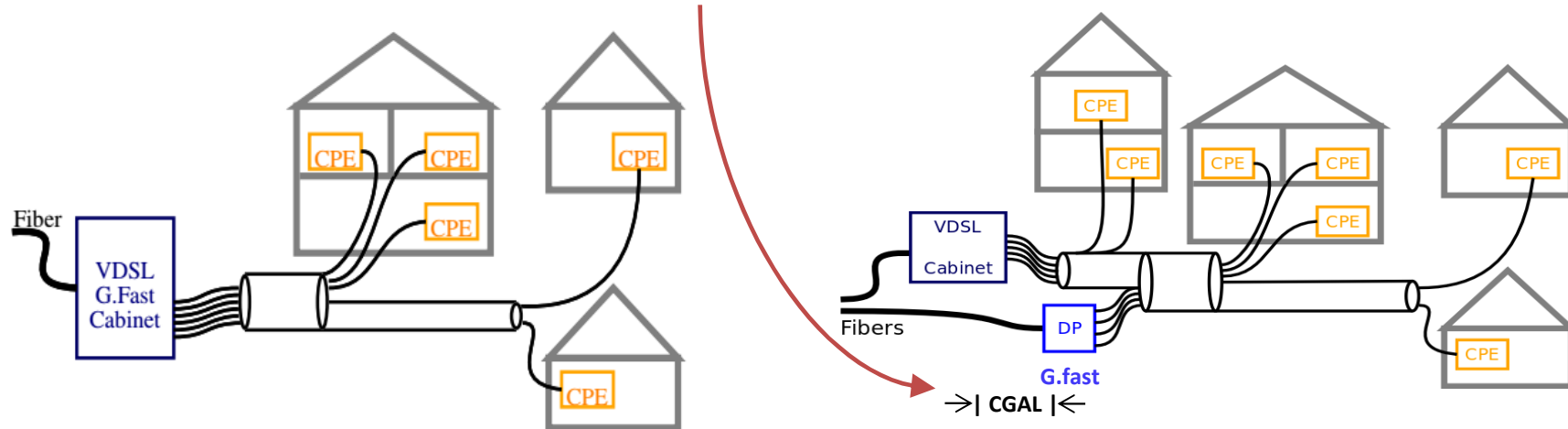




VDSL and G.fast deployments

Cabinet G.fast Assigned Loss (CGAL)

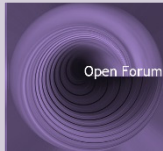
Represents attenuation from VDSL2 Cabinet to G.fast DP
(already defined in current ANFP ND1602 V6.1.1)



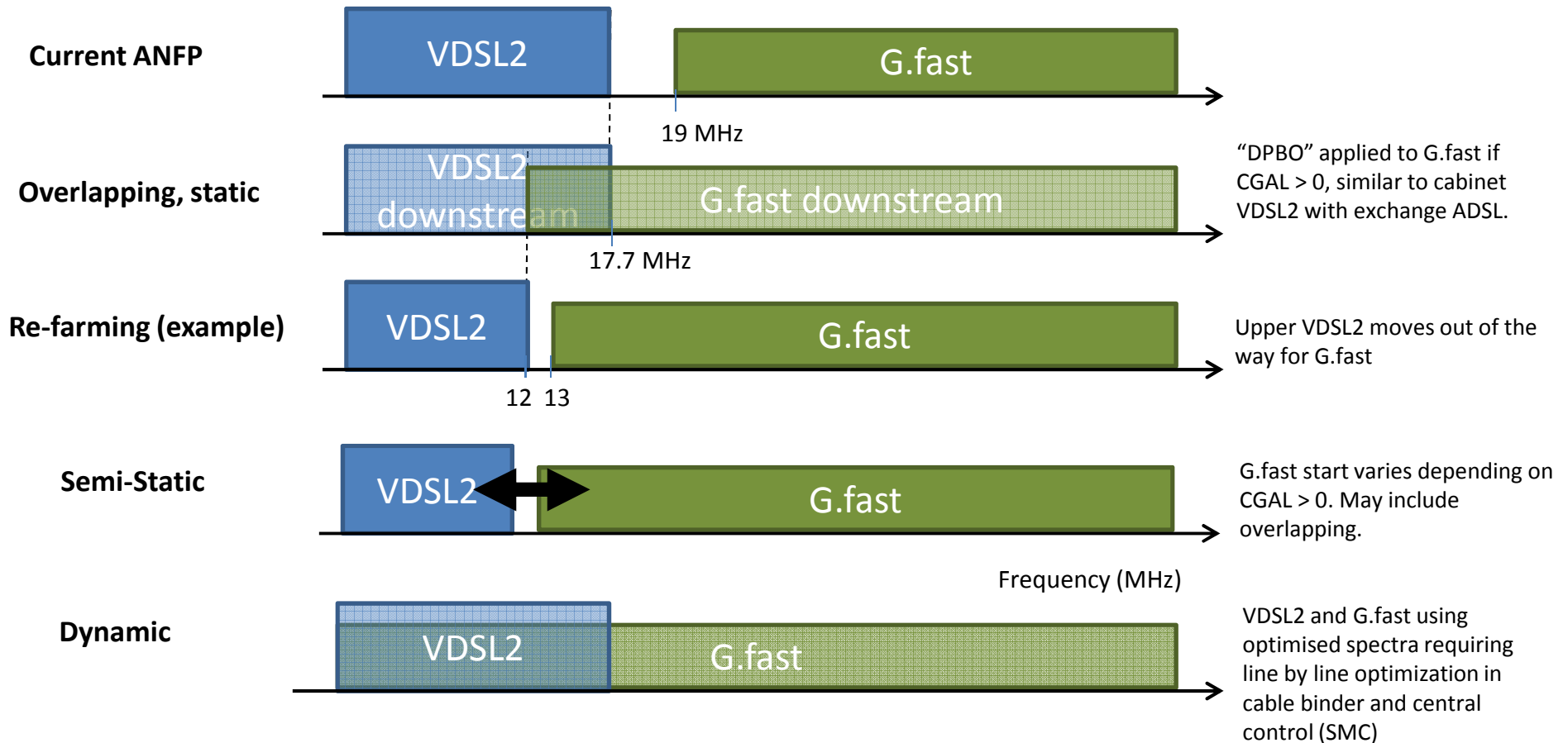
VDSL2 and G.fast from the same Cabinet
CGAL = 0

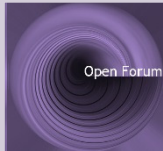
G.fast DPU closer to Customer Premises
CGAL > 0





Some of the spectral options





Key spectrum control options

- **Static**
 - Limited number of PSDs
 - No new control parameters
- **Re-farming**
 - Specify cut-off frequency between VDSL2 and G.fast
- **Semi-Static**
 - Uses parameter such as VDSL2 to G.fast DSLAM cable loss (CGAL) to control PSD shapes
 - Can allow G.fast in frequencies down to the VDSL2 Maximum Usable Frequency
 - Similar to VDSL2 management today
- **Dynamic**
 - Manages PSD shapes to achieve agreed rate optimisation point





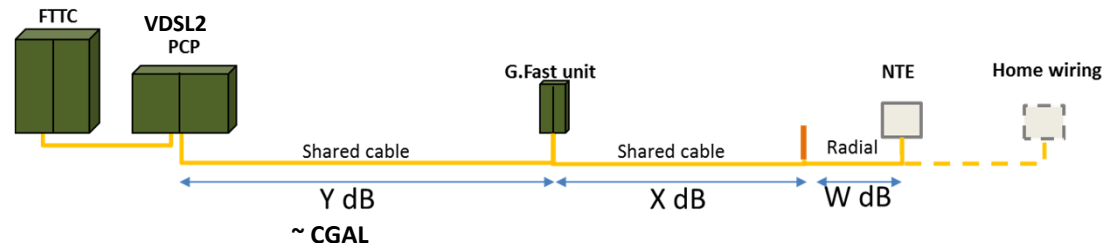
Example G.fast performance improvement

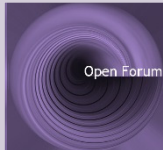
Simulation models and assumptions detailed in ND1520
Averages, 12 G.fast and 8 VDSL2 in a cable binder, 80% G.fast allocated to downstream

Average Downstream G.fast gain above current ANFP (Mbit/s)	
Static overlapping	16 to 50
Re-farming, e.g. 13 MHz	47
Semi-Static	TBC
Dynamic Management (DSM)	50 to 164

Note: Re-farming can adversely impact the max attainable downstream bit rate of some VDSLs.

Note: DSM gain is sensitive to whether G.fast and VDSL2 are co-located or not.





Outlook for 2018

Complete the technical study into options for ANFP change for G.fast and possibly VDSL spectra
(ND1520)

Potentially update the BT ANFP & guidelines to enable increased rate and reach for G.fast
(ND1602 & ND1405)





Summary

- The NICC DSL TG is very active on G.fast and VDSL spectrum considerations
- The study on options to extend the G.fast spectrum has taken longer than expected
- Complex computer simulations covering key use cases
- Varying control complexity options studied
 - Static, through Semi-Static to Dynamic Spectrum Management
 - Work left to do on Semi-Static option
- Study expected to complete early in 2018 and this will set direction for a potential ANFP update
 - Requires work item update and TSG approval





Thank You