

Keeping you updated about our activities! Here we highlight our latest work and focus on areas which are most critical.



A Word from our CEO

The big news is that Broadband 20/20 has been launched to the world and as I write this note for the newsletter, industry approval continues to land on our doorstep.

Many of you will have seen the media coverage around our three launch events - Gigabit Europe, the SDN and OpenFlow World Congress and the Broadband World Forum - but you will not know the overwhelming support we have received in private meetings and conference calls we have held virtually continuously since we all left from our meeting in Porto.

The industry has - without exception - welcomed our initiative and our vision, with enthusiasm, encouragement and an endorsement of what we are trying to achieve. There's almost a sense of relief that that there's finally an organization focused on creating new markets and revenue and not just on technology.

The Forum members should be proud of the way they have smoothly adapted to a new structure and then to the Broadband 20/20 vision that followed swiftly behind it. Your questions and your suggestions helped us to finally go to the industry with a well thought out vision and one backed with effective use cases that directly impact on service providers globally. It has been a fantastic team effort but I hope you will all join me in particularly thanking our Marketing Director Mark Fishburn, who worked tirelessly throughout to achieve our vision and message.

So we have taken a very positive first step, and now our focus is delivering on Broadband 20/20. One key step was taken this meeting with the alpha release of our FTTdp management model contained in WT-355.

Someone who has shared many steps with us over the years has been Les Brown. We were delighted to present him with the Distinguished Fellow Award at the start of the meeting (see separate story). I'm sure he will continue to make many important contributions in the months ahead.

I will close by welcoming our new members Cyta and Netcomm Wireless Limited. You are joining us at possibly the most exciting time in the history of the Broadband Forum.

Thank you so far.

Robin Mersh, CEO

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In case you missed it...

As part of our activity around our highly successful Broadband 20/20 vision launch, we teamed up with *Light Reading* to host a webinar. Entitled '*High-value services for*

broadband enabled by NFV and SDN,' the webinar was very well received - with an audience of more than 200 and heavy post-event viewing.

If you missed it and would like to find out how our members are turning our Broadband 20/20 vision into a reality, please [click here](#).



Top accolade for Les Brown

Les Brown, director of the Broadband Forum, of Huawei Technologies, was presented with the Forum's top accolade during our Q4 meeting.

The Distinguished Fellow title is bestowed by the Forum to individuals who have provided a major influence on the direction and success of broadband development. Having served on the Broadband Forum's Board of Directors since

2002, Brown embodies the development of the Forum and the progress of access from ADSL2/VDSL2 to today's focus on G.fast. He has also chaired a number of projects to define standards and make developing technologies marketable.

"The evolution of the Broadband Forum would not be possible if it weren't for the expertise of its members," said Kevin Foster, Chairman of the Broadband Forum. *"When the Broadband Forum started there were about one million broadband subscribers and now there are more than 750 million. This is an extraordinary achievement and one which would not be possible without the hard work of our members, like Les, on our various projects."*

To watch a video interview with Les and find out more about his achievements in the Forum, please [click here](#).

Have you seen our New Broadband Forum LinkedIn page?

We have launched a new LinkedIn company page which we are inviting all our members to follow for official updates from the Forum, including news, events, images, videos and documents.

In addition, we would also like to boost our presence with sponsored content. In order to do this, we need more than 100 followers. With more than 1,500 people already following our Group page, we're sure we'll soon pass the milestone.



To view the new Broadband Forum company page on LinkedIn, please [click here](#).

Birds of a Feather - 5G and the Broadband Forum

Convened by Christele Bouchat, of Alcatel Lucent, on behalf of the Innovation Track Group at the BBF, this special evening session featured many speakers from the Forum, as well as Stephen Hayes, of 3GPP and Ericsson. It was organized to start addressing the impact of 5G on broadband networks, the work already going on - both at the Broadband Forum and 3GPP and NGMN - and what the Forum should do next. Several proposals are under consideration,

both in terms of market requirements and architectural studies. Work will start at the Broadband Forum but we will be closely cooperating with our partners.

Work Area Updates from Puerto Vallarta, Mexico

SDN and NFV in the spotlight once again

The SDN and NFV Work Area was very much in the limelight again in Mexico, following the successful launch of Broadband 20/20, where one of the launch events chosen was the SDN and OpenFlow World Congress. The work is geared towards an enhanced focus on the application of SDN and NFV concepts into the Multi-Service Broadband Network (MSBN), and addresses software-defined control and virtualization of functions in network elements across the access and aggregation networks, coordinated with the Architecture and Migration Work Area.

The work has already expanded into a new project within the SDN project stream. This addresses YANG modelling for SDN access nodes and will use the same best practices that have been developed while defining YANG models for the FTTdp project.

In NFV, the stream's initial priority is the virtual business gateway (WT-328). Known as vBG, the architecture describes the migration of functionalities running on the business gateway to the network service provider's infrastructure for enabling network-based features and services. This migration is expected to simplify the deployment and management of network and business services.

Since both SDN and NFV technologies have architectural implications, a great deal of the Work Area's activities are conducted jointly with the Architecture and Migration Work Area. In addition to the WT-328 work described above, this joint work also includes WT-345, which defines the specific requirements necessary to support the migration of the MSBN infrastructure, topologies and deployment scenarios into an NFV environment, and WT-359, which is defining a framework for network virtualization.

Broadband User Services (BUS) continue good work on TR-069

The Broadband User Services working group had a productive week, agreeing to several new work items to consolidate and publish version 1.5 of the CPE WAN Management Protocol (TR-069 Amendment 6). This incorporates several updates and new features from the TR-069 Issues List and rounds out what is expected to be a stable version of the protocol for some time.

The group also welcomed the release of a white paper on how to use the existing TR-069 protocol to enable the smart home. This marketing report, MR-278, shows how providers can and are using CWMP to deploy and manage the plethora of user devices in the new Internet of Things (IoT) world.

This report acts as a segue to the group's newest and most ambitious project - the creation of an intelligent user services platform for the development, deployment and support of broadband-enabled applications and services. It expands the concepts explored in TR-069 device management towards overall service management, leveraging technologies such as IoT, NFV and SDN in concert with other standards organizations. You can find a two-page summary of the new project [here](#), which explores both the requirements and development methodology used for the new platform.

Breakthrough: FTTdp Work Area to publish first Alpha release

The Fiber to the Distribution Point (FTTdp) Work Area had a very positive and productive meeting. With the group now focusing on all aspects of FTTdp architectures, it has maximized the participation and contribution of all experts. All three project streams had productive sessions.

The FTTdp Interop & Testing project stream, under the leadership of Lincoln Lavoie, of UNH-IOL, and Mauro Tilocca, of Telecom Italia, agreed to the outline structure of an interoperability test plan for the interface between the Persistent Management Agent (PMA) & Distribution Point Unit (DPU). This document would then be used in future plugfest events.

The FTTdp Management project stream, led by William Lupton, the Forum's Software Architect, and Ken Kerpez, of ASSIA, progressed the work on the YANG modules for FTTdp Management and made steady progress on the addition of various modules into the overall management model. We have also hit a key milestone in the development cycle as we will be publishing the first Alpha release to allow member companies to start testing and validating the YANG modules in WT-355. We encourage member companies to use the new model and give us feedback in order to make it production ready.

Last but not least, the Architecture and Requirements project stream led by Michael Schaffer, of Alcatel-Lucent, and Dong Wei, of Huawei, had good discussion on the process for DPUs to discover the PMA, support of G.fast over other copper connectivity such as coax and enhancing backhaul capacity for larger DPU sizes. We also had productive joint meetings with other Work Areas covering some significant issues on Reverse Power Feed.

FAN gives more flexibility in the access network

There has been further progress on Multi-Wavelength PON Inter-Channel-Termination Protocol (ICTP) Specification (WT-352), which enables the ability of NG-PON2 systems to hand off control of ONUs across wavelengths, allowing more flexibility in the access network.

Project WT-280, G-PON in the context of TR-178, which adds to requirements for G-PON systems deployed in access networks, was re-energized with significant activity in the form of important contributions, led by new stream leaders Vincent Buchoux of LAN and Hugues Le Bras of Orange.

The work area discussed a proposal from FSAN regarding joint FSAN/BBF XG-PON1 interoperability test events.

Physical Layer Transmission makes progress on RPF and VDSL testing

In the G.fast testing and certification project stream, there was significant activity on the advancement of WT-338 - the test specification of Reverse Power Feed (RPF) equipment. This document defines procedures for testing the end-to-end functionality of RPF equipment in FTTdp applications at both customer premises and DPU locations.

In the VDSL2 testing project stream, there was further progress on performance and functionality testing of transceivers supporting the new VDSL2 profile 35b, which allows vectoring compatibility between VDSL2 transceivers operating with 35 MHz bandwidth and transceivers operating with 17 MHz bandwidth (current profile 17a). Profile 35b allows operators to provide customers served on shorter loops with enhanced data rates beyond those of vectored profile 17a, while customers on longer loops receive the current quality of

service offered by vectored profile 17a.

In the bonding project stream, a framework was agreed for testing of the initialization time of VDSL2 transceivers deployed with bonding, for inclusion in a new amendment to WT-273.

In the home networking project stream, work progressed on inclusion of application layer tests in WT-208 issue 2, the powerline home networking test suite.

Architecture and Migration Work Area push forward with NERG and FAN work

There has been a significant push to complete the virtual home gateway work (WT-317) known as NERG (Network Enhanced Residential Gateway). This is important because it will be one of the first applications of NFV to be addressed by the Forum and member companies are already showing great interest in what is being developed. It is expected that there will be follow on work as much of the NFV aspects require definition across the industry.

The work area has also initiated one document on Fixed Access Network Sharing and is discussing two more to produce a suite of documents enabling a business model to permit the sharing of access facilities between carriers or between separate business divisions of one carrier, which could lead to significant acceleration of fiber buildout around the world. A related effort for the sharing of copper access (WT-349) is now technically complete and will be published early next year.

Public Wi-Fi work has been completed and published as TR-321. This will help drive commoditization of the equipment involved and simplification of Wi-Fi operations for carriers.

Progressing the Forum's work on SDN and NFV, major topics taking center stage here were the virtual business gateway, overall SDN and NFV architecture and migration strategies. A number of technical recommendations are expected to be published mid-2016.

A study of the impacts of 4K video on the network is now underway. With the proliferation of smartphones able to extract a UHD stream directly from the network, this is expected to dominate network dimensioning in the metro for the foreseeable future and is a major issue for the Forum to address.

Wireline-wireless Convergence Work Area focus on 5G

This work area addresses the needs of converged operators, who have both wireline and mobile networks deployed and are in a position to leverage all of their assets with combined subscriber offerings. The work area is doing some initial studies looking at the impact of 5G in driving further technology with increasing commonality in what has previously been completely isolated technology silos.

Phase one of the work on hybrid access, which combines wireline and wireless access to enhance reliability, provide fast fulfilment and offer greater bandwidth, is nearing technical completion and is expected to be published early next year. Phase 1 lays the groundwork for the solution space that will be addressed by Phase 2 commencing early 2016.

Significant development on Cloud Interconnect Project

The Routing & Transport Work Area got straight to work with major activity around Packet

Optical Evolution (WT-319) and Cloud Interconnect (WT-350), as well as addressing critical work around Mobile Routing and Transport (TR-221) that will provide higher bandwidth and coverage on LTE Networks around the world.

In packet optical, the project has already produced specifications integrating the packet network with the colored optical network, thereby consolidating equipment needed - bringing with it potential significant OPEX and CAPEX savings for operators. The project is now resolving issues identified by members and liaison partners such as IETF. The resulting document will provide further efficiencies for operators.

The Cloud Interconnect project is focused on movement of data to deliver cloud-based services in a way that ensures customers experience no degradation of service wherever they are in the world. As with other projects, it is being managed on the basis of incremental delivery. The first phase of the work on E-LAN was approved and published in Q4 2015. Work has progressed on the tutorial and phase two of the architecture (E-LINE) proposed in Porto. Proposals for two white papers were approved and are targeted for 1H2016 completion. The papers will highlight the benefits of EVPN for implementing general Ethernet services (e.g., for Mobile Backhaul) and use in Data Center Interconnect.

The Mobile Routing and Transport project is critical to providing enhanced network synchronization needed to support the greater density of small and macro cells - helping multiple base stations better co-ordinate radio signals between themselves. This work is also seen as helping to prepare for a 5G world.

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Documents approved include:

- TR-069 Amendment 6

These documents will be published in the following days, however for a full list of all work in progress, [click here](#). Please feel free to share this information with your colleagues, so they are engaged and aware of the developments of this work.

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Welcome to our new and returning Members!

We are pleased to welcome Cyta and Netcomm Wireless Limited as new members.

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Forum's work impresses prospective new member

Among the observing companies who attended this week was Michelle Miller, Product Manager at Greenlee Communications, who contributed her input on the Q4 meeting as a first time attendee.

Michelle was intrigued by the level of collaboration of industry leaders from around the world as they discussed test and implementation practices for next-generation access technologies.

She said: "The proposals and on-going contributions presented in many sessions were truly inspiring as we work toward the Broadband 20/20 initiatives. The knowledge and experience that was brought to the table should instill all the confidence in the world that this industry will be well served in the years ahead."

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Global Telecoms Business: Smoothing the way for a seamless broadband delivery in NFV world

Our CEO Robin Mersh recently spoke to Global Telecoms Business about the Forum's vision and challenges that lie ahead for an industry moving ever closer to NFV adoption. To read the full article, please [click here](#).

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Events Calendar

2016 Broadband Forum Meetings:

- Q1 Meeting: February 1 - 5, Hong Kong
- Q2 Meeting: April 18 - 22, Europe
- Q3 Meeting: July 25- 29, Europe
- Q4 Meeting: October 24 - 28, North America

Sponsoring a BBF meeting can be a great way to get some company recognition! If you are interested in sponsoring a meeting, then please [click here](#) for more information or contact Christine Corby at ccorby@broadband-forum.org.

Forthcoming Industry Events:

- [IIR Network Virtualization Asia](#), December 2 - 3, Singapore
 - [Globecom 2015](#), December 6 - 10, San Diego, CA, USA
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Contact information

Questions or ideas? Contact the [Broadband Forum](#) +1 510.492.4020 or email info@broadband-forum.org