

BBF Quarterly Newsletter

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

Q4 2017 Newsletter



A Word from our CEO

As the end of 2017 approaches many of our members will be celebrating Christmas and New Year, and later Chinese New Year too, we should also spare a moment to mark what has been a significant 12 months for the Forum and the work we are doing.

We have seen a major shift in the last year, with the work, processes, tools and focus of the Forum adapting in line with the requirements and expectations of the industry.

During this meeting we took a great step forward in the 5G area by announcing a landmark project with NTT to standardize the virtualization of operators' PON networks to support the delivery of Time Critical Applications (TCAs) in areas such as fronthaul for 5G.

The project was initiated by NTT and will open up new business opportunities for operators and vendors by using technologies like Network Functions Virtualization (NFV) and Software Defined Networking (SDN) to allow them to cost-effectively upgrade their PON networks to enable the rapid introduction of new services – including 5G fronthaul. 5G is of course a very active area in the Forum and that work made great progress both in New Orleans and at the recent interim meeting in Berlin.

Other areas that have seen momentum are the Cloud Central Office project, where the baseline document will soon be finalized and the associated interface and testing documents are starting, as well as the User Services Platform specification, which is also completing and moving onto the exciting prospect of plugfests in January.

The Open Broadband - User Managed Objects Framework project also debuted, where we will be starting work following our alliance with the Distributed Management Task Force Inc. (DMTF). This project has a great potential for service providers looking to create an application marketplace that leverages resource information on their current home gateways. Another Open Broadband project, Broadband Access Abstraction was also approved to begin work, and will see practical work starting in January.

You can read more about some of these announcements elsewhere in this newsletter, but a further significant development is that projects like these have already seen a number of new companies join us to support the work and play a part in its progress. I am tremendously encouraged by seeing these new companies coming on board and 2017 has been one of the most successful for several years in attracting additional organizations from around the world, and many have new skill-sets to bring. Rhonda Heier, has done a great job at connecting the Forum to the wider broadband community.

Recent BBF Newsletters (PDFs)

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Also new this year was the announcement and development of the Gfast and NG-PON2 Councils and our Broadband Access Summit Events (BASE). The summits in Berlin and Las Vegas were so successful that we have just announced plans to stage a second series, with the first one just prior to the quarterly meeting in Athens, Greece, next March. Further details will be announced soon.

Internally, I would like to thank William Lupton, Mark Fishburn and the member team supporting them, for the work they have been doing around the tools we use within the Forum to get the work recorded and completed. As a result, some 18,000 contributions now sit safely in JIRA and soon the Forum's mailing lists will be moving to Google Suite, while calendars will be moving from ARO to the Wiki. This – and more – all takes time and can be a real hard slog, but I appreciate what is being achieved to ensure we have robust systems in place. I was also like to welcome April Nowicki to our team who comes to the Forum to help support the new tools and helping the membership in getting the full benefits of some software which will help collaborate even more effectively.

Enjoy this newsletter and thank you for your contributions to a great 2017. I look forward to sharing more achievements with you all next year.

Robin Mersh

December 2017

Landmark project to virtualize operators' PON networks for 5G Fronthaul

A new project with NTT has been launched within the Forum to standardize the virtualization of operators' PON Networks to support the delivery of TCAs, such as 5G fronthaul.

The project looks to open up new business opportunities for operators and vendors by using network virtualization technologies such as NFV and SDN to cost-effectively upgrade their PON networks and enable the rapid introduction of new services. This includes the key issue of fronthaul for 5G services, adding to the Forum's ongoing work on the convergence of fixed and mobile networks.

"As users' usage changes, both in regard to the different services required and the amount of data coursing through fiber networks, operators need to update their PON networks, including by adding TCAs," said Akihiro Otaka, Executive Manager at NTT Access Network Service Systems Laboratories. "This used to require the remake of PON equipment for each service, but should be done via a software upgrade in the near future to improve cost-effectiveness. With demand for this increasing, it is important we ensure there are standards in place to achieve a vendor-agnostic system and ensure mass deployment of this new system architecture, which is essential if we are to deliver agile and flexible next-generation broadband networks for emerging services."

The project – PON Abstraction Interface for TCAs – looks at how NFV and SDN can be applied to Optical Line Terminals to disaggregate PON functions to functional modules with open interfaces. The first phase will define the disaggregation policy and functional requirements of interfaces to disaggregate PON functions which need time-critical processing, while the second phase will define the detailed specifications of the interfaces as Application Programming Interface (API) sets.

The project has already attracted a number of new members to the Forum, as the industry becomes more focused on how the fixed network can help deliver 5G.



BASE 2018: Call for papers opens

After successfully hosting the inaugural BASE earlier this year, the Broadband Forum will be kicking off the BASE 2018 series in Athens, Greece on March 23rd and 24th.

The workshop's call for speaker proposals is now open, with subjects including virtualized broadband, cloud, the managed home, 5G wireless/wireline convergence and high-speed access.

The summit aims to provide attendees with a whole new perspective on what is being made available for broadband providers and users alike, delivered by the leaders in the industry, many of whom are active participants in the Forum's work.

Those who are interested in applying to speak are encouraged to address the impact next-generation technologies have on broadband by highlighting use cases, technology solutions, technology trends, best practices and contributions in standards development. If you are interested in applying, please click [here](#). To register to attend, please click [here](#).



Broadband Forum collaborates with Cartesian to address hurdles in adoption of virtualized networks

As the telco industry continues to transition to software-driven cloud-based services, the Broadband Forum has provided its expertise for Cartesian's latest report, which addresses the current play of NFV, SDN and next-generation network architectures.

Cartesian's report *The Future of Networks: Dealing with Transformation in a Virtualized World*, produced in association with the Forum, addresses the prevalent industry hurdles on the path to digital transformation, including operational challenges, an industry-wide skills gap and the cultural transformation for networks and IT departments.

The report - which draws on more than 40 interviews and an online survey with more than 100 respondents, including telecom vendors, system integrators and Communication Service Providers (CSPs) – highlights that 73% of respondents believe their companies are behind schedule in their NFV/SDN deployments.

Robin Mersh, CEO of the Broadband Forum, was presented as one of the key industry decision-makers in the report, discussing the status of digital transformation and approaches to overcome the industry challenges being faced. Reflecting on the results, Mersh stated: "Whether through recruitment drives, a greater focus on standardization, or the provision of educational programs, the research shows we know where changes need to be made."

For the full report, please see: <https://goo.gl/w8993y>



Broadband Forum forms alliance with the DMTF

The Broadband Forum has announced a new alliance with the [DMTF](#), an industry standards organization with a global presence made up of members from 43 countries. Through its work on standards, the DMTF works to simplify the manageability of networks-accessible technologies through open and collaborative efforts of its expanding portfolio of member technology companies.

The [DMTF's Redfish® API](#) is an open industry standard specification which aims to publish a standard API to meet customer demand for simple and secure management in modern Software Defined Data Center (SDDC) environments.

Under the agreement, the Broadband Forum will have access to Redfish® manageability expertise within the DMTF and it will have the authorization to refer to the established DMTF Redfish® technologies for specifying compute and networking domain manageability of platforms.

The Broadband Forum and the DMTF aim to collaborate closely wherever possible in advancing relevant interoperability standards for broadband operators to deploy cloud services and applications.

For more information on what the alliance means for the industry, watch this video interview with Michael Bugenhagen, Chief Architect, NFV, at CenturyLink: <https://youtu.be/8VadMp7Wggs>

Testing gets reality check in new Broadband Forum global testing initiative

During the New Orleans meeting, a new project stream was formed to specify the generation of test traffic at the application layer – a critical phase of work – to increase the level of realism of test conditions in the laboratory to better reflect actual conditions out in the field.

Key industry stakeholders will benefit including service providers, vendors and laboratories, by fundamentally allowing them to manage the complex traffic of subscribers on the network.

The work will be carried out within the Architecture and Migration Work Area and will involve four initial projects – architecture and requirements, definition of the associated models, an implementers' guide and a software reference implementation.

"We expect this work to be immediately useful to projects like Open Broadband, as well as other work both in and outside the Broadband Forum," said Project Stream Leader and Board Member Ken Ko. "The work will allow us to formally define complex traffic behavior at the application level in a way that is unambiguous and repeatable, making it extremely valuable in a wide range of lab test scenarios."

Work Area Updates from New Orleans



Virtualize that: Architecture and Migration Work Area looks at NFV and SDN

The Architecture and Migration Work Area has continued to work on the development of TR-359 Issue 2. Building on the momentum of the NFV-enhanced architecture foundations defined by Issue 1, Issue 2 introduces SDN and greater management and will reflect work done in the Cloud CO project. This will increase the applicability of virtualization to the wider multi-service broadband network. Work is progressing well and is expected to go to straw ballot in Q2/2018.

The group is continuing to work on the use cases for Broadband Assured Services.

A new project on Generation of Application Test Traffic kicked off. The goal of this project is to ultimately produce an open source traffic generation tool that will allow networking equipment manufacturers to generate aggregated traffic patterns in order to validate equipment performance under a variety of conditions, improve scheduling algorithms, etc. The project is scoped to have four key deliverables, the ultimate one being the tool itself.

A study of use cases for the repurposing of existing premises infrastructure such as coax was also initiated.



Broadband User Services finalizes USP changes and plans Plugfest

The Broadband User Services (BUS) Work Area is finalizing recent changes to its highly anticipated User Services Platform (USP). The evolution of its flagship protocol, TR-069, is set to continue, with the release of version 1.0 expected at the end of Q1 2018. Just ahead of this release will be the first USP Plugfest, which will be held in Atlanta, Georgia, from February 20-22. Details of the Plugfest will be available soon

The BUS Work Area is working in conjunction with the Physical Layer Transmission Work Area to push forward the development of real metrics for Wi-Fi performance testing. These can be used to qualify devices for service provider home deployments. This work came as a result of a perceived gap in standards from providers and is on track to provide some real value to the chaotic world of in-home networking



Common YANG project moves forward

The Broadband Forum Common YANG Project made significant progress in New Orleans. The group continues to expand on the set of Common YANG models required for management of ultrafast broadband access networks based on copper and fiber technology. In particular, progress was made on managing multicast services, optical transceivers, statistics collection using IPFIX and copper line testing using SELT/MELT and loop diagnostics. This steadily solidifies the baseline set of Common YANG models that are part of TR-383 and FTTdp YANG models, defined in TR-355. In essence, it enables service providers to manage a triple play service via NETCONF/YANG

In parallel, the project remains engaged with the progress made in the Internet Engineering Task Force (IETF), with focus on two ongoing projects. The first of these is to align with the strategic direction of the new IETF Network Management Datastore Architecture (NMDA) while striving for backward compatibility through the existing approach to handle operational and state data. Secondly, there is great interest in leveraging a draft model for alarm management which aligns with the needs of Forum requirements.

Finally, the group has nearly completed the Straw Ballot comment resolution for the new YANG model to manage [G.hn](#) home networks. This work is captured in WT-374 and is expected to be published by Spring 2018.

Moving into the new year, the group expects to kick off an interop testing activity related to the NETCONF/YANG communication between the Persistent Management Agent (PMA) and the Distribution Point Unit (DPU). With this work, the goal is to target multi-vendor deployments that can fully leverage the key assets of NETCONF/YANG.

For more on why the Common YANG Work Area is so important, watch this interview with Sven Ooghe, Product Line Manager, Fixed Networks, at Nokia: <https://youtu.be/DDisz3mELgw>



NETCONF/YANG management solutions set for 2018 and beyond

The second FSAN/BBF XGS-PON/NG-PON2 interoperability test session on October 9-13, 2017 was a complete success. The primary purpose of this event was to drive technology maturity through multi-vendor testing, reducing the operational and capital cost of residential and enterprise fiber access deployment for service providers. This event test report showed a significant increase in the number of test cases passed, proving the market is moving quickly to a matured state.

The PON management project stream continues to expand. Anticipating deployment of new NETCONF/YANG management solutions in 2018 and beyond, the new WT-414 NetConf and YANG Interoperability Test Plans document will assist service providers in systematically validating management system implementations, accelerating their path to a more unified SDN/NFV fiber access network infrastructure.

The Project Stream for "Passive Optical Network (PON) Abstraction Interfaces for Time Critical Applications" continues to make excellent progress. This work is needed because operators are interested in providing more additional value or differentiated services to meet the trend towards more diversified network requirements, particularly where the network is used as business infrastructure. These include dynamic bandwidth allocation, energy-efficient Optical Network Terminal (ONT) sleep mode, dynamic wavelength allocation and network protection.

Stay tuned for upcoming announcements on the BBF-247 certification programs for XGS-PON and NG-PON2. In 2018, the first beta certification test for next-generation ITU-T technologies is expected to be launched. These new technologies will be game changers for the service provider community.



Innovation Group explores Fixed Wireless Access in the context of 5G

The Innovation Group hosted a Birds of a Feather session in New Orleans, with the 5G project stream focusing on Fixed Wireless Access, An Operator View. AT&T took part in the session, sharing its experience of Fixed Wireless Access deployments. This confirmed some of the key requirements already discussed in SD-407 for a 5G RG and the 3GPP core, including the importance of IPv6 and DHCPv6 support.

There will be several key topics covered in the BoF sessions in 2018, including the Internet of Things (IoT), 5G, CloudCO and orchestration, and network slicing in Fixed Mobile Convergence (FMC).



Physical Layer Transmission continues Gfast progress

The group continued to work on issue 2 of ID-337 (Gfast certification), with the goal of going to straw ballot at the Q1 2018 meeting in Athens. This second phase of the certification program will address coax operation, 212 MHz operation and generally increase its performance requirements.

There was also progress on adding Long Reach VDSL2 (VDSL2-LR) performance, functional and vectoring tests.

Work with BUS continued on test setups for Wi-Fi performance (WT-398).

It was also agreed to start work on SD-419, which addresses use cases for extending fiber access over existing in-premises infrastructure. This will be done jointly with the Architecture and Migration Group.

The Work Area was also busily engaged resolving straw ballot comments on the following four documents going to final ballot in Q1, following a mid-meeting conference call. They are: WT-114i3a2 (35b performance), WT-115i3a1 (35b functional), WT-338i1 (reverse power feed) and WT-400 (Gfast bonding). Two other documents which will be sent to straw ballot after the conference call are WT-114i3a4 (re-transmission Performance) and WT-347 (CPE SELT Operation Guidelines).



Routing and Transport Work Area focuses on 5G transport

Following its long history of providing mobile backhaul architecture and nodal requirements, the Routing & Transport Work Area continues with 5G, progressing several activities.

The group continues to work to transform transport and IP networks to efficiently support 5G and the innovative services brought about by 2020 mobile networks. These new services, through the development of applications that they enable, generate new revenues both for the provider and their customers. The network requirements for the anticipated services is driving activity on use cases, architecture and technology enhancement. Included in these are:

- Work to integrate Flexible Ethernet into IP/MPLS networks. This gives TDM-like characteristics to packet networks for performance and isolation needed for network slicing.
- Deterministic transport, based on IETF DetNet and IEEE Time Sensitive Networking (TSN). This gives packet networks predictable and stable performance that can be used to serve applications and services demanding ultra-low latency, high reliability and high scalability.
- Continued work with our partner organizations (3GPP, IETF, ITU-T, IEEE, MEF, and others) to coordinate activities.

Those interested in the details of the projects and progress are encouraged to contact the Area Director and/or Project Stream Leads for suggestions on how to get involved and contribute



SDN and NFV Work Area send first Cloud-based Central Office Technical Report to final ballot

The overriding framework Cloud Central Office project (CloudCO) document, WT-384, has completed Straw Ballot and has been progressed to Final Ballot as a result of this meeting. The group spent some significant time reviewing the results of the service provider survey, which was authored at the previous meeting, in order to gain insight into the specific migration use case scenarios.

These results will help guide the future development of methods by which legacy broadband networks may gradually migrate to a CloudCO and support coexistence within the same network. There was also good discussion around the related working text and the addition of some use cases was agreed. The Work Area also continued its activities on its other deliverables, including Migration to SDN-enabled Management and Control, CloudCO Interfaces and Test Cases for CloudCO Applications.

The first issue of Fixed Access Network Sharing (FANS) is now approved and published as TR-370. This important work provides the framework for the sharing of physical infrastructure between Virtual Network Operators (VNOs) and gives them the possibility to manage the equipment as if it were their own.

Beginning in 2018, we will be driving forward the completion of our work program for CloudCO with WT-408 (CloudCO Migration), WT-411 (CloudCO Interfaces), WT-412 (CloudCO Testing), WT-413 (Migration to SDN enabled management and control) & WT-416 (CloudCO Scenarios & Use Cases). We will also complete the FANS suite with WT-386 (FANS Interfaces) – which was featured in a recent report by Ovum researchers. The Open Broadband – Broadband Access Abstraction (OB-BAA) project should also be full steam ahead. This project will be open to external contributors, and separately organized to the Forum's Technical Committee, but is still linked to the work of the CloudCO project.



5G Front and center for Wireline-Wireless Convergence Work Area

The Wireline-Wireless Convergence (WWC) Work Area addresses the needs of converged operators, which have both wireline and mobile networks deployed and are in a position to leverage all their assets with combined subscriber offerings.

Study work on 5G fixed access continued throughout the Q4 meeting, with a focus on the integration model and deployment considerations with respect to existing networks. This will be used to assist both 3GPP and the Broadband Forum to develop normative specifications in the release 16 timeframe. The first recommendations with respect to architecture, protocols and procedures will be completed in the Q1 timeframe.

Study work on network slicing continues as the group develops a deeper appreciation of the impact of this 5G-centric topic on fixed and transport networks.

Work on WT-378 nodal requirements for hybrid access was nearing completion, with the document expected to go to straw ballot in Q1.

New Broadband Forum tools delivering increased agility and faster working

The Forum's way of working has shifted to fast interactive discussions through the Atlassian Tools: the BBF Wiki, JIRA, Confluence and Bitbucket.

All new contributions are now posted to JIRA - see the link below



all CONTRIBs

Questions? Contact April Nowicki, Member Support Manager anowicki@broadband-forum.org

- WT-177 Corrigendum 1 IPv6 in the context of TR-101 (TR-177 Corrigendum 1)
- WT-156 Issue 4 Using GPON Access in the context of TR-101 (TR-156 Issue 4)
- WT-355 Corrigendum 2 YANG Modules for FTTdp Management (TR-355 Corrigendum 2)

WT-370 Fixed Access Network Sharing - Architecture and Nodal Requirements (TR-370)

These documents will be published in the coming days. 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.

Welcome to new and returning members!

We are pleased to welcome six new and returning members to the Q4 meeting, including Comcast, Telefonica, Telkom Indonesia, Kurth Electronics, Chengdu Superxon Communication Technology Co., Ltd, MoCA and The Broadband Communications Chamber of Ghana.

Broadband Forum in the news

Since the Q3 meeting, the Broadband Forum has received media interest from a variety of top tier publications.

- [PC Mag](#) covered the continued growth in Gfast adoption, mentioning recent global deployments of the technology. The Broadband 2020 vision was highlighted by [UBB2020](#) which covered the pavilion's work at Broadband World Forum in Berlin. [UBB2020](#) also carried an in-depth article focusing on the success of Plugfests to drive Gfast adoption forward.
- The Plugfest which took place in Tauxigny, France was covered by [FibreSystems](#) which listed the companies taking part, including ADTRAN, Broadcom, Calix, CommScope, Econet, Huawei, Intel, MT2, Nokia, Sagemcom, TiBit Communications and ZTE.
- Broadband Forum boosts presence of Gfast and NG-PON2 technologies with social media strategy
- The Broadband Forum has made a continuous effort to build its social media brand and promote the work of our members further, including the success of the BASE event and our members' activity surrounding Broadband World Forum.
- As part of an initiative to promote and increase industry awareness of the BASE series, we actively shared content using the relevant Gfast and NG-PON2 hashtags, creating engagement and interest around the technologies and the event.
- Kevin Foster, Chairman of the Broadband Forum, acknowledged the significant increase in the Forum's social media interest at the Q4 meeting, encouraging members to continue this presence by actively participating and sharing news from the Forum.

Please connect with the Broadband Forum on [Twitter](#) (@Broadband_Forum), [LinkedIn](#), [Facebook](#) and [YouTube](#) and use #Gfast and #NGPON2.

Events Calendar

2017 Broadband Forum Meetings. Keep the below dates free for next year's quarterly meetings.

- 2018 Q1 Meeting: March 26-29 (Athens, Greece)
- 2018 Q2 Meeting: June 11-14 (Osaka, Japan)
- 2018 Q3 Meeting: September 10-13 (Montreal, Canada)
- 2018 Q4 Meeting: December 10-13 (Europe)

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

Forthcoming Industry Events

- FTTH Conference: Feb 13-15, Valencia, Spain
- Gigabit Copper 2018: April 10-11, Brussels, Belgium

- Internet of Things Summit: April 19-20, San Francisco, US
- Telco Cloud World Forum: April 17-18, London, UK
- ONUG Spring Meeting: April 18, San Francisco, US
- China SDN/ NFV Conference 2018: April 17-18, Beijing, China

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