broadband forum

Shaping the Future of Broadband

WELCOME TO THE BROADBAND FORUM
QUARTERLY NEWSLETTER

Your quarterly resource for updates on recent activities and our most critical work and focus areas.

A Word from our CEO

With the European Commission allocating €573 million to provide fast Internet access for more than 7,000 Italian municipalities and 12.5 million residents, broadband in Italy is developing at an unprecedented rate. This made Milan an ideal location for our Q3 meeting as we enter an exciting and progressive time within Broadband Forum.

Among the highlights in Milan was OutSys' first-of-its-kind Practical Demonstration Implementation of our Broadband Quality Experience Delivered (Broadband QED) initiative. The demonstration is a significant milestone in Broadband QED, which is critical as end-users and regulators focus on more than just data rates.

Broadband QED is not the only project gaining momentum within the Forum. Following substantial developments in our Connected Home standard, User Services Platform (USP), and CloudCO, we will debut numerous demonstrations at Broadband World Forum (BBWF) 2019. Three will focus on the Connected Home, highlighting how service providers can seamlessly and securely manage connected devices as smart home technology grows increasingly popular. These demos will show a practical application of Broadband Forum initiatives, including one led by Vodafone, emphasizing the important role USP, machine learning and Broadband QED will play in operators' future networks. Vodafone's interest is echoed by the influx of new members we've seen over the last year wanting to get involved in USP and our Connected Home initiatives.

Delivering on the promise of the Connected Home depends on an efficient network that can transport data to and from millions of bandwidth-hungry devices. Our CloudCO initiative tackles this need, within this work area as well as through the latest developments of Open Broadband – Broadband Access Abstraction (OB-BAA) set to be showcased at BBWF. Again, due to work progressing so substantially, a host of new capabilities will be revealed.

5G also remains a key focus at Broadband Forum. At our Q3 meeting, a special session on 5G Verticals was held, providing new food for thought for all Work Areas on how their work will be impacted by developments in this promising wireless technology. This coincided with an important step for the Wireless-Wireline Convergence (WWC) Work Area, which has now started to reach consensus and document the decisions it was making at earlier meetings in regard to its work on Fixed Mobile Convergence (FMC).

Underpinning all our work at Broadband Forum is the critical question of security. A constant consideration across all Work Areas, security has been thrust to the forefront of the broadband industry due to the continued growth of the Internet of Things (IoT) and smart devices. Our Birds of a Feather (BoF) session at the Q3 meeting discussed the importance of standards and legislation in this area, provoking much discussion. I am sure this will continue to be an area of renewed focus for the Forum as we move into the next phase of broadband deployment and a new era of connectivity.

A summary of the Q3 meeting and the multiple ways that Broadband Forum is actively shaping the future of broadband delivered by Broadband Forum Chairman Kevin Foster can be seen here.

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Broadband Forum leaps forward in the pursuit of better broadband quality of experience with its QED and ALT initiatives

Significant progress in efforts to enhance the quality of the broadband user experience was reached at the Broadband Forum Q3 meeting.

In a first-of-its-kind Practical Implementation Demonstration as part of Broadband Forum's Broadband QED initiative, innovative carrier-grade solutions vendor OutSys showed how service providers can look beyond conventional measurements such as minimum/average/maximum latency and jitter to provide operators with deeper insights that can form the foundations for overall broadband experience improvements.

Addressing this same challenge from a different angle, Broadband Forum also announced the publication of Application Layer Test Traffic Architecture and Requirements Technical Report-421 (TR-421), which defines an architecture and requirements for the specification of test traffic and measurements associated with the application layer – an area critical to broadband service quality, but historically overlooked.

"The broadband industry has already achieved remarkable results when it comes to delivering high bit rates to the premises, but operators are now turning their attention to broadband performance and quality," said Geoff Burke, Chief Marketing Officer at Broadband Forum. "The demonstration from OutSys and the publication of our Application Layer Testing (ALT) specification are great examples of what can be accomplished when the industry comes together. To see this tremendous progress realized from projects that were only launched at the beginning of this year is a tremendous accomplishment for Broadband Forum members involved in this work."

To watch a video of the demo, click here.

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Special BoF session sparks discussion on securing the future of broadband

Security continued to be a prevalent theme for Broadband Forum at the Q3 meeting, with industry experts highlighting the importance of having standards, legislation and robust security models in place to tackle the threats associated with the explosion of smart devices and the IoT.

During a special BoF session on security, Tom Gaffney, of F-Secure, Elmer Lastdrager, of SIDN Labs, and Sowrirajan Padmanabhan, of Nokia, discussed the level of threats and how the industry can combat them, with one member defining security as 'the Achilles heel of IoT'.

Gaffney also highlighted the growth in the number and sophistication of the cybersecurity threats facing the industry and the need for action.

"There has historically been a lack of standards and although this is changing with increased discussions with governments and standards bodies, legislation will be years from now," he said. "Security is often an afterthought for businesses, and they need to make sure they have robust security models in place, and if they are slow to replace out-of-date systems, someone will find and exploit this vulnerability in the future."

The panel highlighted the vulnerability challenges which IoT has presented and how to solve them, with the education of users, introduction of better practices for manufacturers and the quarantine of bad actors at ISP level among a host of suggestions moving forward. Broadband Forum members discussed the costs associated with protecting against hacker attacks and the way to tackle this without burdening technicians, customers and increasing overheads but agreed that the cost of an incident would outweigh the cost of protection.

Gaffney added: "Security measures need to come from the industry and get pushed by the government to get them over the line. Vendors and service providers are in the driver's seat and are culpable as they need to offer some level of security for their customers."

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BASe series and Broadband Forum Councils expand focus areas

As Broadband Forum continues in its mission to educate the industry on the latest technology developments, best practices and the importance of standardization, its popular Broadband Acceleration Seminar (BASe) series will expand its areas of focus to encompass additional technologies including Fixed Wireless Access (FWA), use cases and technologies for the PON roadmap, 5G fixed and security.

Broadband Forum's Councils – which serve to centralize and disseminate the expertise and experience of various technologies in order to encourage market adoption – will also take on these topics in their work. This will ensure Forum members and the industry are up to date on the latest trends and know how new technologies will impact the Forum's ongoing initiatives.

"As our industry continues to change at a rapid pace, we want to ensure our Councils evolve alongside this and encompass areas which are becoming increasingly relevant to our members and the entire broadband industry," said Bernd Hesse, BASe chair for Broadband Forum. "We look forward to generating discussion on these areas at future BASe events and member meetings, with some topics already set to appear on the agendas of our upcoming BASe sessions at Broadband World Forum and in Las Vegas."

To learn more about Broadband Forum's Q4 BASe events, watch this video interview of BASe chair Bernd Hesse.

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5G verticals set to disrupt traditional network operators' business models

The full impact of 5G will only be felt when it is made available to different vertical industries rather than just consumers. This was the key message delivered by Dr Raffaele De Peppe, 5G PPP Board Member and Vertical Task Force Chairman, during a special session on 5G Verticals at the Q3 meeting.

5G is set to disrupt the industry over the next decade both at the infrastructure and network level. The United States and Republic of Korea, along with a host of European countries, are now offering this new technology to the mass market but, highlighted Peppe, only on the consumer side, for now.

"Early 5G trials are addressing the consumer side but the big 5G revolution will be on the industrial side as it will enable digital transformation in a lot of industries," said De Peppe. "The service level customers are asking for are really new network services which are actually running over a 4G and 5G network – what will be revolutionary about 5G will be that vertical

industries will ask not for 5G services but a network slice. This is something that is very new and quite revolutionary."

According to De Peppe, the network slices that vertical industries will require will lead to traditional network operators moving from providing mostly conventional services, such as voice and data, to offering network slices to vertical industries.

De Peppe went on to explore this scenario with a use case of autonomous driving, highlighting how 5G can prevent accidents and ensure safe driving.

Following the presentation, Broadband Forum members discussed 5G verticals that their work and expertise could potentially be applied to, including connected and automated mobility, smart cities, Industry 4.0, consumer and professional services, transportation and public safety, and the digital divide in the future.

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WWC needs you (if you're a CPE vendor)!

As the WWC Work Area moves forward with specifying a new class of Customer Premises Equipment (CPE) – the 5G-RG – it is calling for CPE vendors to participate in the work.

The 5G-RG will be designed to specifically integrate with a 5G core by employing a 5G signaling stack and possibly providing support for devices using 3GPP procedures in the home. It may also have a fixed WAN interface, LTR or NR WAN interface or both fixed and wireless interfaces for hybrid access.

CPE vendors are required to participate in the project to ensure that the specifications ultimately generated are clear in order to facilitate simple implementation and provide important input and advice in regard to technical choices. Vendors who decide to participate will be given opportunities for downstream deployment options and networking opportunities with other vendors in the WWC ecosystem. As the work evolves, interoperability and certification options will also be explored.

The work already involves major carriers in each of the Asia, North American and European markets.

If you are a CPE vendor and would like to get involved in this work, please contact Work Area Director David Allan at david.i.allan@ericsson.com.

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Get your geek on! BASe returns for BBWF 2019 and Calix's ConneXions

Following the astounding success of this summer's Ultra-fast Broadband (UFFB BASe), Broadband Forum has organized further BASe events in October.

The first workshops – focusing on the Connected Home and 5G – will take place at BBWF 2019, at the RAI Amsterdam on Tuesday, October 15. These will be followed by the BASe North America Summit at Calix ConneXions in Las Vegas on Saturday, October 26, where speakers will cover a range of topics including 5G, the Connected Home and security.

Created by technology innovators for technology leaders, the BBWF BASe sessions and BASe North America Summit will see major operators, technology leaders and innovators come together and provide their expertise on topics from across the industry for all participants in attendance.

"BASe has continued to gain momentum in 2019, and we are honored to be hosting our two

BASe events at BBWF and ConneXions as we aim to bridge the gap between the marketing hype and the technical and operational realities that are impacting opportunities for service providers," said Bernd Hesse, BASe chair for Broadband Forum. "Our membership is composed of the world's leading technologists who are seeking actionable insights, share perspectives, and network with their tech peers from around the world."

Click here to find out more or register for the BASe event and/or the ConneXions conference.

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Work Area Updates from Milan, Italy

For a full list of all Technical Reports published by Broadband Forum, click here. Please feel free to share this information with your colleagues, so they are engaged and aware of the developments of this work. For additional insight and to get involved, sign up for the members-only Broadband Forum tools and access your member-only account using your company email address.

Everything is cooking for ATA

- **Target:** The Access & Transport Architecture (ATA) Work Area maintains primary architectural work of Broadband Forum. This work reflects the control, management and data plane aspects of Broadband Forum's defined architectures. These architectures are augmented to leverage new industry practices, while protecting the investment in broadband networks already deployed.

- **Progress:** The group has a record-breaking five white papers that are in the approval or publication process coming out of the meeting. These cover hybrid access motivation, EVPN, Disaggregated BNG, QED and ALT.

- **Outcomes:** The protocol PFCP was selected for Disaggregated BNG.

The ATA Work Area made progress across a vast range of projects at the Q3 meeting.

In the area of 5G Transport, the group is currently midway through defining the 5G architecture and requirements. The requirements introduce the use of new transport and routing technologies, for example, even segment routing and deterministic transport such as IETF DetNet and IEEE TSN.

With regard to transport network slicing management, the group is creating the linkage between 3GPP network slicing management and orchestration and existing transport and routing network management and orchestration. This includes the initiation of a new WT on Mobile Transport Network Slicing Management Interfaces (MTNSI) that will define architecture and requirements for this linkage. The work will be coordinated with 3GPP SA5 and other relevant Broadband Forum partner organizations.

A new white paper on use of EVPN for carrier Ethernet services was approved for publication. The paper describes the motivation and advantages for using EVPN to provide Ethernet services, including the ELINE, ETREE and ELAN service types defined by MEF.

In the Disaggregated BNG project, a major milestone was reached with the Work Area selecting PFCP as the protocol for Disaggregated BNG (WT-459). The group is also in the process of completing the work on the Disaggregated BNG architecture and requirements as well as providing guidance on message flows for the architecture.

Two new work items were proposed on Carrier Grade NAT (CGN); the first would look at its

architecture and use with Disaggregated BNG and the second would provide deployment guidance on application compatibility. These proposals are currently under consideration and will be discussed again on 1 October.

The group has reorganized a number of its testing initiatives to create a new project stream – Performance, Experience and Application Testing (PEAT). Within this project stream, the group is progressing work on IP performance measurement at the CE-edge using STAMP, Application Layer Testing data modeling and quality of experience testing technical specification.

Last but not least, new work has been started on IP performance and capacity testing. This work examines and specifies new IP capacity testing methods for measuring high speed IP connectivity that overcome the limitations of existing IP service "speedtest" methods and tools. Based on output from a recent workshop at MIT, these new testing methods and metrics will be of interest to all IP service providers, especially those providing high speed broadband access. This work is being carried out in cooperation with IETF IPPM, ITU-T SG12, ETSI STQ.

For more information about the Architecture and Migration group, please see: https://wiki.broadband-forum.org/display/BBF/Architecture+and+Migration.

The latest video with Work Area Director Dave Sinicrope can be viewed here.

BUS celebrates the completion of version 1.1 of TR-369

- **Target:** Help service providers control the connected home business model.

- **Progress:** The group has completed version 1.1 of User Services Platform (TR-369) and has released Device:2.13 (TR-181), the data model for USP and for CWMP/TR-069.

- **Outcomes:** The group plans to launch certification testing for USP in Q4 and is finalizing work with the WWC Work Area to add 5G interface modeling to TR-181.

The Broadband User Services (BUS) Work Area is celebrating the completion of version 1.1 of its revolutionary USP (TR-369), which will be launched at https://usp.technology in the coming weeks. Along with this, the group has also released Device:2.13 (TR-181), the data model for USP and for CWMP/TR-069. This version adds support for multi-AP Wi-Fi deployments, including the availability of WFA Data Elements statistics and modeling of 802.11ax/WPA3 interfaces. It also adds the ability to perform remote packet capture diagnostics and standardized objects for IoT sensors and controls, launching USP's capability to manage and control every aspect of the connected home.

Moving forward, the group plans to launch certification testing for USP in Q4 and is finalizing work with the WWC Work Area to add 5G interface modeling to TR-181, as well as device requirements for 5G fixed gateways in TR-124. It is also continuing work on the next version of its popular Wi-Fi In-Premises Performance testing suite, which will incorporate tests for Wi-Fi 6 deployments.

For more information on BUS' ongoing work, visit: https://wiki.broadband-forum.org/display/BBF/Broadband+User+Services.

To watch the latest video interview with BUS Co-Director Jason Walls, click here.

Common YANG says yes to copper bonding

COMMON YANG

- **Target:** Specify YANG modules that are applicable to multiple Work Areas, NETCONF/YANG test plans and certification for the defined YANG modules, and maintain YANG Best Current Practices, processes, procedures and tools.

- **Progress:** Major progress in defining YANG models for managing bonded DSL lines; continued work on managing the Access Node Control Protocol (ANCP) and hardware management; first proposal to define YANG for managing Broadband Network Gateways (BNGs).

- **Outcomes:** Create corrigenda for the YANG Modules for Fiber-to-the-distribution-point (FTTdp) Management and the Common YANG Modules, making existing YANG modules more robust.

This week, the Common YANG Work Area has seen the first inputs come in to define YANG Modules for BNGs (WT-460). This work will ultimately result in a set of YANG modules for key BNG functions, allowing service providers to smoothen interoperability for BNG deployments. Additionally, this work may very well be applicable within the scope of the Disaggregated BNG project.

Work on Amendment 3 of the YANG Modules for FTTdp Management (WT-355a3) is progressing very well – the group approved the first set of contributions that will enable the YANG management of bonded DSL lines. This significantly broadens the scope of applicability of YANG modules for managing copper-based ultrafast broadband.

Work continued on Amendment 3 of the Common YANG Modules for Access Nodes (WT-383a3), which will further enhance the suite of YANG Modules. The main focus this week was on hardware management as well as managing the Access Node Control Protocol (ANCP). These developments will meet service provider requirements, enabling additional functionality for network troubleshooting and data analysis for ultrafast broadband over VDSL, FAST and Passive Optical Networks (PON).

For an overview of the Common YANG Work Area's work, please visit: https://wiki.broadband-forum.org/display/BBF/Common+YANG+Work+Area.

To hear the latest updates from Co-Director of Common YANG Sven Ooghe, click here.

FAN moves forward with several documents

FAN Fiber Access Networks

- **Target:** Inter-Channel Termination Protocol (WT-352) is awaiting additional contributions but will hopefully be concluded by 2020 Q1.

- **Progress:** WT-385 Issue 2 ITU-T PON PMD and WT-431 Issue 1 EPON Yang has also progressed.

- **Outcome:** WT-423 Issue 2 PON PMD test plan has been sent for final ballot and an ID-247 straw ballot readiness meeting will be scheduled for the end of September.

Since the Q2 2019 meeting, the Fiber Access Networks (FAN) Work Area has made progress in three of its key project streams.

The PON Management Project Stream is dedicated to the development of NETCONF management models for ITU-T and IEEE PON YANG models as described above.

Within the Interoperability and Test Project Stream, work continued on both the PON PMD test

plan (WT-423) and ONU interoperability and certification test plan (ID-247), as described above. Issue ID-247 Issue 4 focused on 10G PON is going out to straw ballot and WT-423 Issue 2 is in final ballot. Recently FAN has approved WT-309 Issue 2 Amendment 1 PON TC Layer Test Plan NPIF.

The XGS-PON Plugfest was completed in July 2019 and a report was generated. The group is discussing having a follow up Plugfest in the 2020 Q2 timeframe. Additional details will be published in the future.

Within the Unassigned Project Stream, FAN has also progressed WT-280 Amendment 1 PON in the context of TR-178 requirements.

To hear the latest updates from FAN Director Marta Seda, click here.

Innovation Group turns its attention to 5G verticals and security

The Broadband Forum hosted two special events during its Q3 meeting in Milan, Italy. A session presented by speaker Raffaele De Peppe, 5G IA Board Member and Chair of the Vertical Engagement Task Force, provided an update on the work of the 5GPPP European Project, with a definite nod to the IoT and connected automobiles. The session sparked further discussions within the WWC, ATA, and BUS Work Areas, and Broadband Forum is sure this will inspire some of the future work and innovations expected in those groups.

An evening BoF session on Security also took place on Monday evening, with experts: Tom Gaffney, of F-Secure; Sowrirajan Padmanabhan, of Nokia; and Elmer Lastdrager, of SIDN Labs providing their views on security and its impacts to broadband networks and forthcoming 5G capabilities. The presentations were followed by a discussion with the meeting participants. This session encouraged all Broadband Forum Work Areas to add secure elements by design into the different Technical Reports they are producing, from IoT elements to security of network elements and the end-to-end network itself. This is likely to be just the first session in a series focused on security of broadband networks, systems, and connected devices.

OB-BAA releases enhancements for use in other open source projects and supporting Broadband Forum initiatives

Building on the functionalities in its second release, the Open Broadband – Broadband Access Abstraction (OB-BAA) project provided a minor release of the project in July of this year. This added more features and examples that are to be used by other open source projects – for example, ONF SEBA – and activities such as Broadband Forum's demonstration of the CloudCO framework during this year's BBWF conference.

As part of the BBWF demonstration, OB-BAA will showcase its multi-vendor, multi-protocol adaptation, zero-touch and automation capabilities of the CloudCO BAA layer, showing how the BAA layer is used to automate zero-touch service creation, activation and relocation. It will also show how the BAA layer accelerates migration to cloud-based access networks by expanding the breadth of vendors by leveraging its ability to facilitate co-existence, seamless migration and adaptation to an increasingly wide variety of software defined access technologies and implementations.

A video interview featuring perspectives from Mauro Tilloca of TIM, Broadband Forum Board member and a key service provider participant in CloudCO/OB-BAA demo, can be seen here.

A video summary of OB-BAA progress to date and plans for the future from BAA leader Tim Carey can be seen here.

OB-MAP defines high level architecture for topology database

The Open Broadband – Multi Access Point (OB-MAP) project together with prplMesh has defined a high level architecture that will allow OB-MAP to provide a complete topology database. Work on the details of the APIs and the database continue. The database will enable granular control and troubleshooting of the local network.

The project also continues to ensure that all physical layer technologies are supported in the context of the database and network topology.

While prplMesh decided to use a different source code than meshComms, it is still the intent of OB-MAP to further extend meshComms. meshComms does not yet fully support easyMesh capabilities and will have to include any new APIs needed to support this topology database. The new prplMesh is in C++ but it is considered important to have an open source implementation in C as well.

Physical Layer Transmission reaches major milestones, finalizing VDSL2 test suite and publishing Gfast related recommendations

- **Target:** To help service providers deploy equipment that will give a better quality of experience for their end-users.

- **Progress:** The Physical Layer Transmission group continued work on its Gfast performance testing and certification, as well as fiber access extension over existing copper infrastructure.

- **Outcome:** Four documents have passed technical review and are ready to go for final approval. They are WT-114 Issue 3 Amendment 3, WT-115 Issue 3 Amendment 2 and WT-249 Issue 2 which all relate to VDSL2-LR (Long Reach) and ID-337 Issue 2 Amendment 1, covering the addition of certification of the 106b Gfast profile. VDSL Long Reach greatly increases the reach of VDSL, allowing the operator to have more deployment scenarios and to replace the legacy ADSL.

TR-285 Issue 2 (cable models), TR-338 Issue 1 Amendment 1 (reverse power feed test plan) have been published.

The test framework of WT-380 (Gfast performance test plan) which focuses on single line tests is going to the technical review stage. This test framework enables the Work Area to start the measurements setting the Gfast performance requirements, which it is aiming to finalize during Q4. The next step is to define the test framework for multi-line performance measurements.

Work on the next revision of the Gfast certification test plan has started. This revision aims to include certification of software download, operation with Dynamic Time Assignment (DTA) improvement of the response times of the Gfast connection and verification of accuracy of test parameters.

Projects WT-419/SD-419 further detail use cases and requirements for extending fiber access over existing local copper infrastructure. This work will help telecom operators to offer fiber-like speeds on their existing copper infrastructure where the installation of fiber is not yet economical.

To gain further insight into what the Physical Layer Transmission Work Area is doing, visit: https://wiki.broadband-forum.org/display/BBF/Physical+Layer+Transmission.

A video summary of the latest work in PHYtx can be seen here.

Industry support continues to grow for vOMCI, with first Plugfest on the horizon

- **Target**: To drive the migration of SDN and NFV into broadband networks to facilitate the agile deployment of new customized distributed broadband services and applications.

- **Progress**: Industry support continues to be strong for vOMCI (WT-451) with significant contributions pushing the development of the document forward.

- **Outcomes**: The CloudCO Migration topic (WT-408) has now been significantly restructured and the gaps highlighted will be filled before the next meeting with the expectation of publishing the paper in the first half of 2020.

The SDN/NFV Work Area now has ten separate projects in flight following the approval of the latest Metro Compute Network Study Document (SD-466).

On WT-408, the identified gaps within the CloudCO migration Working Text will be communicated to the Work Area in order to stimulate contributions to close those gaps. This will allow those topics of the highest priority to be addressed within the paper before going to publication.

On WT-451, the group is working towards a Plugfest to validate and test the completeness of the requirements within the Working Text before final approval. One of the Open Broadband Labs (OBLs) will conduct the Plugfest.

Work on the new Issue 2 of the Fixed Access Network Sharing (FANS) (TR-370) has progressed and the document will move to straw ballot once the relevant points in the meeting have been concluded. This updated document adds cloudification into the FANS process and aligns the document with the CloudCO framework, as defined by the SDN/NFV Work Area.

More information about the SDN/NFV Work Area can be found at: https://wiki.broadband-forum.org/display/BBF/SDN+and+NFV.

A video summary of the latest updates in the SDN/NFV work area can be seen here.

OB-USP-Agent accelerates work on Release 2

The OB-USP-Agent group is continuing to work on Release 2 – also known as the "Blackbird" release – with a view to publishing this during October in time for Broadband World Forum. Blackbird will bring support for the CoAP Message Transfer Protocol (MTP), as well as some minor improvements which will make it easier to integrate the software into devices.

Work on 5G FMC progresses with work on Release 16 expected by year-end

- **Target:** Address 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.

- **Progress:** The Wireline-Wireless Convergence Work Area (WWC) is aggressively looking to complete populating the documents that will provide

the normative specifications for the equipment that will connect wireline to the 5G core and the CPE it will serve. The area's target is to substantially have the work for Release 16 complete by year end.

- **Outcomes:** Complete solutions to FMC will be delivered in the release 16 timeframe as originally planned.

Work in the WWC Work Area is now increasingly focused on the technical details that require specification, addressing the needs of converged operators with both wireline and mobile networks deployed who are in a position to leverage all their assets with combined subscriber offerings. This work will allow converged operators to provide a uniform experience to their customers irrespective of the access or appliance they are using. This will be supported by a common and streamlined back office and control plane.

Broadband Forum and 3GPP are now deeply engaged in ensuring the myriad of technical details required to generate detailed specifications are addressed. This is in respect to CPE network equipment and changes to the 5G core.

Broadband Forum is taking an important role in developing 5G, making recommendations for the connection points between the fixed and 5G mobile core networks in order to drive core convergence. At this point in the FMC work, the group has shifted from making decisions to documenting the decisions.

Joint sessions were held across the Technical Committee examining other aspects of 5G where Broadband Forum's expertise could be applied. In particular, with BUS, which saw the go forward plan to execute CPE changes for FMC firmed up. This will enable USP, and its predecessor, TR-069, to contribute to the value proposition of FMC and 5G. The specification of SDN for 5G FMC (known as CUPS or Control User Plane Separation) is now progressing. This will greatly enhance the deployment options available to carriers that embrace 5G and the overall transition to NFV.

A second marketing document on migration of fixed access to 5G was approved and will be published and made publicly available shortly. The group is considering further steps to develop industry awareness and understanding of the technology and value of fixed mobile convergence.

WWC is deeply engrossed in the normative phase of this work, with the specifications set to be finalized by the end of 2019.

For more on the WWC Work Area, please see: https://wiki.broadband-forum.org/display/BBF/Wireline-Wireless+Convergence.

A video summary of the latest updates in the WWC Work Area can be seen here.

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Welcome to new and returning members!

We are welcoming a host of new members to this quarterly meeting, including ALLION, Candela Technologies, IO Intelligence and SIDN.

ALLION, Plume, SIDN and Support Robotics were among the first-time attendees and we were pleased to welcome special guests from Aethra, EOLO, Omniacom and Reply.

Are you interested in becoming the next member of the industry's leading standards body in defining Broadband Networks? Broadband Forum membership will not only accelerate your company's progress but enable you to become a key influencer in developing 5G, the Cloud, the Connected Home and Access Networks. Our new Regional Operator Membership category has further opened participation.

To learn more about the benefits of Membership, watch a video interview of Rhonda Heier, Membership Development Manager, here. She can also be reached at rheier@broadband-forum.org.

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Thank you to our meeting sponsor!

Members attending the Q3 meeting were given the chance to participate in a BoF meeting on security. Our meeting sponsor F-Secure played a key role in organizing this session which was well-attended and provoked much discussion across a number of areas within the hot topic of security.

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Broadband Forum in the news

The last quarter has seen momentum around Broadband Forum grow even further, with a news release announcing 25 new members issued in June. This article highlighted how Broadband Forum's focus on 5G and the Connected Home has been and continues to be the driving force behind a number of new companies getting involved with Broadband Forum's standardization efforts.

Broadband Forum experts have also been called upon to provide industry commentary on a range of topics. John Blackford, of CommScope, and CEO Robin Mersh spoke about USP-Agent with Broadband World News, while CMO Geoff Burke gave insight into SDN for Digitalisation World.

IoT Agenda also hosted an article written by Blackford, discussing how USP can deliver on the promise of the Connected Home. Meanwhile, Broadband Forum's work on Broadband QED was covered Fibre Systems, which hosted an article authored by Mersh.

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Events Calendar

2019 Broadband Forum Meetings

- 2019 Q4 Meeting: December 2-5 – Panama City, Panama

Don't forget to save the dates for next year's meetings:

- Q1: March 2- 5, 2020
- Q2: June 15 – 19, 2020
- Q3: August 31 – September 3, 2020
- Q4: December 7 – 10, 2020

Sponsorship opportunities are available for Broadband Forum's 2019/2020 quarterly meetings.

Sponsoring a meeting is a great way to highlight your company and exhibit your company's innovation in the broadband industry – including demonstrations or prototypes – while showing your support of Broadband Forum. Opportunities vary and can be customized to accommodate a variety of budgets.

Please view the list of our standard sponsorship packages and benefits at: https://wiki.broadband-forum.org/display/BBF/Sponsorship+Opportunities.

If you are interested in sponsoring a meeting, please contact Rhonda Heier at

rheier@broadband-forum.org.

Other dates for your diary:

- Broadband Forum USP Plugfest: Sept 16-20, Durham, USA
- SDN NFV World Congress: October 14-17, The Hague, The Netherlands
- Broadband World Forum: October 15-17, Amsterdam, The Netherlands
- Total Telecom Congress: October 29-30, London, UK
- Gfast Chipset & System Integrator Interoperability Plugfest: November 18-22, Durham, USA
- Convergence India: February 19-21, 2020, New Delhi, India

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<u>Contact information</u>

Questions or ideas? Contact the <u>Broadband Forum</u> on +1 510.492.4020 or email info@broadband-forum.org.