

## A Word from our Leadership Team

The Q3 annual meeting virtually welcomed esteemed members and guests to Ghent, Belgium. At the event, our Work Areas and Open Broadband projects continued to have productive and fruitful meetings with their Broadband Forum colleagues from across the industry. We would also like to express a special thanks to Casa Systems for sponsoring this quarterly meeting.

We were delighted to launch the Open Broadband – WWC Reference Implementation for 5G-RG (OB-5WWC) project, that will bring the full benefits of the 5G ecosystem to fixed-line services and create a reference implementation for 5G-Residential Gateways. We invite all members and non-Broadband Forum members to get involved and join the key operators, vendors and developers from across the industry who are already taking part in this exciting new project.

The Forum took part in our first “in-person” event this quarter since last March, when we attended Fiber Connect 2021 in Nashville. It was fantastic to see so many people from the broadband industry in attendance.

The BBF BAsE team have seen huge success and high levels of participation at our virtual industry events so far this year which highlights the crucial role that the schedule of Broadband Forum events plays in engaging and educating the industry. We have already welcomed more than 70 speakers at our BAsE events. and have a busy quarter ahead with important events to round-off the year including the virtual FTTH Council Europe and our own UFBB virtual event, along with the face-to-face BBWF and BAsE North America.

In addition, we are already planning BAsE 2022 extending our reach with new industry events and associations recognizing the need to educate the industry players, large or small.

It is exciting times for our BBF.398 Grade Wi-Fi Program, as we will soon be announcing our first successful vendors. The first Broadband Forum BBF.398 Grade Wi-Fi products will help service providers save costs and improve the overall customer experience. The Open Broadband projects continue to promote industry collaboration and have published a number of specifications.

As we welcome more new members and guests into the quarterly meeting fold, it highlights the importance of bringing together leading lights from across the industry that drive our fantastic work and standards development. We would like to take the time to thank you all for your continued support and contributions as we head into a busy final quarter of 2021. We hope to see you face-to-face very soon!





## Broadband Forum and prpl Foundation unite to create a secure cross-platform service delivery framework

Service providers will benefit from greater agility, faster time-to-market, delivery of improved operational support and ultimately the ability to significantly enhance the end-user experience thanks to the latest collaboration between Broadband Forum and prpl Foundation. This will help create a truly interoperable ecosystem of 3rd-party applications and services and allow Customer Premises Equipment (CPE) to be seamlessly upgraded with new innovative services.

The joint effort will see the two industry organizations enhance existing home gateway architecture to enable service providers to more easily deploy, activate and manage portable 3rd-party applications and services, such as Wi-Fi analytics, security and more onto Wi-Fi routers and Home Gateways. Leveraging Broadband Forum's USP, it will open up new opportunities for service providers to deliver value to their subscribers.

The expanded collaboration will explore how USP (TR-369) can be extended to enable "microservices" in home gateways, that will enhance customer experience by improving velocity of service delivery to app-enabled CPE such as Wi-Fi routers and gateways and meet the complexities of a modular firmware architecture.

"The Broadband Forum is very pleased to be joining forces with prpl Foundation to extend USP and the TR-181 Data Models to enable an ecosystem of 3<sup>rd</sup>-party applications and services," Broadband Forum Chairman and BUS Work Area Director John Blackford said. "This ensures fast time-to-market of innovative solutions that are portable across a variety of different CPE platforms. The result will ensure service providers can quickly deliver more value to subscribers and improve overall customer experience."

Read the full press release [here](#).



## Busy vBASEe and BASE calendar continues into Q3

Continuing to build on the 2020 vBASEe session success which attracted nearly 400 registrations on average per event and more than 4,000 downloads, the 2021 series of webinars has involved more than 70 speakers so far. As part of BASE Sponsorship, Broadband Forum's sponsors are invited to participate in its thought leadership webinar series of events that include perspectives from both service providers and technology leading vendors, solution providers and analysts.

So far this year, Broadband Forum has hosted five 'BASE Knowledge events', 10 vBASEe State



of Play Webinars (with a further four planned for the remainder of the year) and its first-ever virtual Broadband Summit. In July and August, the Forum was involved in one face-to-face event, three vBAsE Webinars and one industry third party event. Drawing over 2,000 attendees, FBA Connect in July in Nashville, was the first of a number of important events approaching. This includes the virtual FTTH Council Europe and UFBB, along with the face-to-face BBWF and BAsE North America. A BAsE 2022 sponsorship opportunity will open in October, continuing a mix of both virtual and in-person events.

Our BAsE 2021 sponsors include:



If you want to catch up on the latest Broadband Forum webinars, download the respective recording and slide decks [here](#).

## Thank you to our sponsor Casa Systems!



Casa Systems' detailed presentation included an extensive look at the enablement of ultra-fast, end-to-end broadband technology including core, edge and customer premises connectivity using its Casa Axyom vBNG platform, built with CUPS architecture.

Since becoming a principal member of the Broadband Forum in 2018, Casa Systems has been significantly involved in supporting key initiatives such as CloudCO, and TR-459-based vBNG CUPS. With its software running on dis-aggregated off-the-shelf hardware, Casa Systems serves as a crucial complete solution provider for operators.

Casa Systems strongly believe in the scalability and resiliency of the TR-459 multi-vendor CUPS solution with its Casa Axyom vBNG platform and continue to support, collaborate and recognize the work of the Broadband Forum.

## Work Area Updates

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 access to Broadband Forum tools](#) and access your account using your company email address.

## ATA - Progress in the meeting and over the summer



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

### Outcomes:

- Access Architecture Project Stream - TR-459.3 IPTV Multicast for DBNG - Released!
- Access Architecture Project Stream - WT-459.2 CGN for DBNG - in Final Ballot
- Access Architecture Project Stream - WT-487 DBNG for Wired Access - on to Phase 2: Architecture
- Mobile Transport & Routing Project Stream - WT-521 5G Transport Architecture and Requirements - completing Straw Ballot resolution
- Performance, Experience, Application Testing Project Stream - MR-452.2: Use of DeltaQ to Manage Customer SLA - Released!
- Performance, Experience, Application Testing Project Stream - Participants in PEAT PS working on QED will make individual submissions to the upcoming IAB Workshop on "Measuring Network Quality for End-Users, 2021"

Jonathan Newton, Vodafone was appointed Access Architecture Project Stream Leader - the leadership transition will take place between the Q3 and Q4 meetings over the AA PS conference calls. Big thanks to Jonathan for volunteering and accepting the appointment.

**Progress:** Overall, the ATA Q3 meeting contribution was fairly light likely due to the overlap of the Q3 meeting dates and preparation time with summer vacations. Even so, ATA made substantive progress not only in the meeting but on conference calls between the Q2 and Q3 meetings. Highlights from the meeting and the summer conference calls are below.

### Access Architecture (AA) Project Stream

- TR-459.3 IPTV for DBNG - Released! Big thanks to the Editor Nagaraj Turaiyur, Juniper.
- WT-459.2 CGN for DBNG finished Straw Ballot - and was sent to Final Ballot just before the Q3 2021 meeting.
- WT-487 DBNG for Wired Access - The group agreed to move on from Phase 1: Use Cases to Phase 2: Architecture and Call Flows.
- Subscriber Session Steering (SSS) - AA Project Stream participants are putting together a demonstrator for Subscriber Session Steering (WT-474) in preparation for Broadband World Forum in October. Those interested should see the ATA Subscriber Session Steering Wiki pages.

### Mobile Transport & Routing (MT&R) Project Stream

- WT-521 5G Transport Architecture and Requirements - continues Straw Ballot resolution with more contributions anticipated between Q3 and Q4 this year to conclude the Straw Ballot.
- WT-522 MMI continues development with contributions encouraged for the remaining document sections.

### Performance, Experience, Application Testing (PEAT) Project Stream

- MR-452.2: Use of DeltaQ to Manage Customer SLA - Released! Big thanks to Editor Jonathan Newton, Vodafone.
- PEAT discussed the scope and structure of WT-452.2 relative to protocol specific specifications such as TR-390\*. The group concluded that protocol extension and profiling for QED should be directed to TR-390 and amendments to TR-390 while general protocol requirements, use and method of protocols for QED should be directed to WT-452.2.
- Participants working on QED will make individual submissions to the upcoming IAB Workshop on "Measuring Network Quality for End-Users, 2021".

For more information on ATA Work Area's ongoing work, visit: <https://wiki.broadband-forum.org/display/BBF/Access+and+Transport+Architecture>.

### **BUS poised for the next suite of standards updates in Q4**



**Target:** Continued growth and support of a truly interoperable and standardized Connected Home through the User Services Platform (USP/TR-369) and key partnerships.

**Progress:** The Broadband User Services (BUS) Work Area will be releasing the next suite of standards updates for the User Services Platform (TR-369) and the TR-181 data models that support both TR-369 and the venerable TR-069. These updates provide users with new and efficient ways to manage and monitor consumer Wi-Fi networks, DOCSIS gateways, and more, plus improvements to USP based on the experience gained from operators using it in real deployments even now. USP version 1.2, Device: 2.15 (TR-181), and associated updates to the USP Certification Test Plan (TP-469) are all poised to be released after Q4 2021.

In addition, the group has been working closely with the WWC Work Area on updates to TR-124 for 5G fixed wireless gateways. This provides requirements that operators can use to specify the functions and features of 5G fixed RGs they want to deploy. The group also continued work with the PHYtx Work Area on the next version of TR-398, the popular standard for Wi-Fi performance testing as part of the BBF.398 certification.

Take a look at the BUS Work Area's latest work: <https://wiki.broadband-forum.org/display/BBF/Broadband+User+Services>.

### **Common YANG on track to publish TR-383 Amendment 5 in Q1 2022**



• **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:** Good progress was made on updates to TR-383, covering Software Management, support for IEEE Connectivity Fault Management (CFM), Access Node Control Protocol (ANCP), scale issues and several other improvements. The team agreed on the scope of Amendment 5, which will proceed to Straw Ballot with comment resolution planned for Q4.

- **Outcomes:** The group will start a two-week review on all accepted pull requests. Straw Ballot planned for Amendment 5.

The Common YANG Work Area had a very busy and productive week, thanks to a strong level of participation from both operators and vendors.

The group is progressing well on updates to Common YANG Modules for Access Networks (TR-383). With this new amendment, a broad set of new enhancements will be added, covering Software Management, Device Aggregation, improved alarm handling for Ethernet CFM Operations, Administration, and Maintenance (OAM), management of Voice over IP (VoIP) and ANCP alarms. Moreover, the existing YANG models will be extended, solving scale issues for large-scale deployments. Straw Ballot comment resolution is expected to start before the end of the year. With these modules, service providers can efficiently manage a range of broadband services supported over any access technology, including VDSL, FAST and Passive Optical Networks (PON).

A joint review was held with the SDN/NFV and FAN Work Areas, focusing on the Device Aggregation YANG model. Common YANG is also anticipating further contributions on Amendment 4 of the YANG Modules for Fiber-To-The-distribution-point (FTTdp) Management (WT-355).

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

### Project Streams progress for FAN Work Area at Q3



**Target:** The Fiber Access Network (FAN) Work Area specifies and maintains PON architecture and nodal requirements, PON abstraction and mobile backhaul requirements. It is also responsible for PON test suites related to ITU-T PON Conformance, and compliance Test Plans related to XGS-PON, NGPON2 and PMD Layer. Lastly, it is responsible for IEEE PON YANG and ITU-T PON YANG specifications.

#### Progress:

- The PON Management Project Stream continues WT-385 ITU-PON YANG Management Issue 2 Amendment 1 work.
- The Unassigned Project Stream continues WT-280 Issue 2 ITU-T PON in the context of TR-178 work to address requirements related to PON.
- The Interop Project Stream continues DTP-247 Issue 4 Corrigendum 1: G-PON, XG-PON and XGS-PON ONU Conformance Test Plan.

**Outcome:** The Wavelength Management Project Stream finalized WT-352 Issue 2 Corrigendum 1 Inter Channel Termination Protocol (ICTP) and sent it for straw ballot.

For more on the FAN Work Area's ongoing work, please see: <https://wiki.broadband-forum.org/display/BBF/Fiber+Access+Networks>.



**OB-BAA – Ongoing collaboration between Open Source and Open Standards continues to advance and accelerate the adoption of interoperable, standardized solutions across the industry**

The Open Broadband – Broadband Access Abstraction (OB-BAA) project team recently published release 4.1 of its reference implementation of the CloudCO's BAA layer. This included updates to align its reference implementation to the Broadband Forum's virtualized ONU management specification vOMCI (WT-451). The release also provides the ability for OB-BAA to be deployed in various bare-metal and containerized environments such as Docker and Kubernetes.

With the completion of this release, the OB-BAA team has started development of its next major release. The 5.0 (Essex Skipper) release includes work on the collection of telemetry data from devices and virtualized network functions; cloud-based authentication of ONUs and the ability to automatically discover and maintain virtualized network functions used by the BAA layer by interfacing with the environments that host the virtualized functions. The work from these new functions is expected to be contributed back into the Broadband Forum as part of its cloud-based specifications such as Access & Home Network O&M Automation/Intelligence Interface (WT-484), Access Node Hardware Disaggregation (WT-477) and Interfaces for Automated Intelligent Management (WT-486).

For more on the OB-BAA project's latest work, see: <https://wiki.broadband-forum.org/display/OBBAA/Open+Broadband+Broadband+Access+Abstraction+Project+Home>.

### **OB-MAP and prplMesh continue forging the future of home networking**



The Open Broadband – Multi Access Point (OB-MAP) project and the prpl Foundation's prplMesh project have completed a baseline vision of how data and control commands will be represented in TR-181. This will influence the design of the APIs presented by prplMesh. The data model (and prplMesh APIs) will meet the diagnostics and management needs of service providers that use multiple physical layer networking technologies to deliver ever-increasing broadband bandwidth and innovative services through increasingly complex home networks to end-user devices.

In the future, OB-MAP still expects to produce vendor extensions to IEEE 1905.1 (the protocol underlying Wi-Fi Alliance's EasyMesh specification) to provide carrier-grade capabilities enhancing EasyMesh operation in operator deployments. Once these are complete, the team will also deliver certification requirements for these Broadband Forum extensions that will ultimately lead to the birth of a new certification program.

For more on the OB-MAP project's ongoing work, please see: <https://wiki.broadband-forum.org/display/OBMAP/OBMAP+Home>.



### **OB-USP-Agent continues work on 4.1 and Eagle Release**

**Current Efforts:** The OB-USP-Agent team has been working on several community identified defects and has pushed a 4.1 release to GitHub to address many of those issues. Work



continues on Release 5 (Eagle), which is focused on the implementation of the WebSocket Message Transfer Protocol (MTP) as defined in the USP specification.

**Future Plans:** The aim is to publish Release 5 before the end of 2021.

For more on the OB-USP-Agent project's ongoing work, please see: <https://wiki.broadband-forum.org/display/OBUSPA/OB-USP-Agent+Home>.

## OB-UDPST project team publishes its latest two releases



**Current Progress:** The OB-UDP Speed Test (OB-UDPST) project team released its 7.2.1 Supplemental Release on August 20, 2021. This addressed feedback from testing during the first half of 2021. The team's goal has always been to simultaneously measure IP-Layer Capacity AND Loss, Reordering, Delay variation, etc. under load, and we found that some small parameter changes would help to achieve that goal in the broadest set of circumstances. Realizing this goal/capability in a measurement tool is a leap beyond what most ad-hoc speed tests can do, both in terms of simplified tuning (when needed) and results-reporting.

Release 7.2.1 includes:

- New Load adjustment algorithm default values for the sequence error threshold and the threshold on consecutive intervals with sequence errors or excessive delay variation.
- New discussion of default values in README.md and circumstances when test organizations should consider changes to the default values. In other words, the defaults are provided as a starting point; any test campaign should consider whether one or more default values need to be changed for their specific circumstances.

The OB-UDP Speed Test (OB-UDPST) project team published its 7.2.0 Release on July 16, 2021. This release introduced the first features for compute environment adaptation (OS limitations, clock precision limitations, and CPU power limitations) and an optional JSON-formatted version of the command-line output.

**Future Plans:** The project team continues to evaluate new features for the next release that result from review of new material in Broadband Forum's TR-471 Issue 2, and the harmonized IETF Internet Draft. The team continues to draw new participants to the project, both testers and developers offering their ideas and skills. The team will likely continue work to provide results in JSON format (output), wider code portability, optimizations and additional operating system support. Like any other Open Source project, if you want new features, send developers!

For more on the OB-UDP Speed Test Work Area's ongoing progress, please see: <https://wiki.broadband-forum.org/display/OBUDPST/OB+UDP+Speed+Test+Home>.



## OB-5WWC project launches and opens door to all interested parties

**Current progress:** Open Broadband – WWC Reference Implementation for 5G-RG (OB-5WWC) is an Open Source project focused on



bringing the full benefits of the 5G ecosystem to fixed-line services and offering a full end-to-end solution to operators. The aim is to create a reference implementation of the Broadband Forum specified Wireless Wireline Convergence solution for 5G capable Residential Gateways (5G-RGs). There are already key Broadband Forum and 3GPP specifications available to help fulfill the need for 5G and fixed-line convergence, and a 5G-RG reference implementation will be of great benefit to operators, providing shorter time-to-market for products and reduced development times and cycles.

OB-5WWC also seeks to provide a production grade 5G solution stack capable of integration with OpenWRT/RDK-B frameworks and to provide a reference for testing Access Gateway Function (AGF) and RG test tool development. The founding members from BT, Deutsche Telekom, Telecom Italia, Telstra, Verizon and Vodafone UK had a formal kick off meeting last month.

**Future Plans:** With strong support from the service provider community, the project team continues to identify candidates to broaden the project membership to also include hardware and software vendors. The team will continue to identify key technical challenges and assign a champion to resolve them.

For any interested parties (including non-Broadband Forum members) that wish to be part of the project, please sign the project participation agreement online [here](#).

For more on the OB-5WWC project's current work, please see: <https://wiki.broadband-forum.org/display/OB5WWC/OB-5WWC+Home>.

## PHYtx Work Area starts technical review of WT-476 Performance Test Plan for use of G.hn technology in access scenarios



**Target:** To help service providers deploy equipment that will provide a better Quality of Experience (QoE) for their end-users.

**Progress:** The 'Performance Test Plan for use of G.hn technology in access scenarios' (WT-476) was prepared for Straw Ballot review. The initial draft of 'Reverse Power Feed Testing Issue 3' (WT-338i3) was created. The Working Texts for 'Architecture and Requirements for Home Distribution Networks' (WT-488), 'Fiber access extension over existing copper infrastructure' (WT-419i2) and 'Gfast certification test plan' (DTP-337i4) were further developed.

**Outcome:** The 'G.fast Performance Test Plan' (TR-380i2) has been published.

The PHYtx Work Area continued to make good progress this quarterly meeting.

WT-476 has been prepared for technical review of the testing procedures. A measurement campaign will be organized at the University of New Hampshire between November 1 and November 16 (exact dates to be announced) to create a result set that will be used to determine WT-476 performance targets. This plugfest is open to both the Broadband Forum and HomeGrid Forum memberships. If you are not able to participate, but still want to submit measurements on setups complying to WT-476 requirements, you must notify [Lincoln Lavoie \(lylavoie@iol.unh.edu\)](mailto:lylavoie@iol.unh.edu) prior to November 1 to be included in the result set. Results must be submitted before the end of the plugfest period.

WT-488 addresses the heterogeneous home network infrastructure for delivering multi-gigabit services to end-users. It provides insights into typical 'use cases' and services delivered over a mixture of in-home broadband and narrowband connection technologies. Understanding the in-home infrastructure enables telecom operators and service providers to quickly, easily and cost-effectively roll-out future-proofed fiber-grade services to end-users and devices in homes and businesses.

In general, the devices used in the home can be categorized using a two-dimensional structure:

- Mobility class (Fixed vs Nomadic)
- Connectivity class (Infrastructure - End User Connectivity Device vs End User Device)

WT-338i3 addresses the reverse power feeding over coaxial cable deployments, according to ETSI TS101 548-2. The first draft has been created, with the goal to start Straw Ballot review in the first quarter next year.

WT-337i4 was further extended with the addition of the test procedures for the verification of Robust Management Channel (RMC) Tone Masking and Recovery, as well as the test procedures for verification of 'HLOG Accuracy'. RMC Tone Masking and Recovery is crucial in maintaining the stability of the internal G.fast management channel, while HLOG accuracy provides operators with a tool to analyze, troubleshoot and maintain the quality of the access network.

To gain further insight into the current work of the Physical Layer Transmission Work Area, visit: <https://wiki.broadband-forum.org/display/BBF/Physical+Layer+Transmission>.

### SDN/NFV publishes TR-454 ahead of busy final quarter



- **Target:** To drive the migration of SDN and NFV into all aspects of broadband networks to facilitate the agile deployment of new customized distributed broadband services and applications for operators with greater operational efficiency and lower cost.

- **Progress:** The SDN/NFV Work Area continues to progress the Cloud-based-Central Office (CloudCO) project for virtualized network functions, SDN management and control and CloudCO domain orchestration capabilities in Broadband Network. The project encompasses an expanding set of deliverables addressing Reference Architecture, Interfaces specifications, Software reference implementations, Coexistence and Migration and exemplary implementations and testing. The SDN/NFV Work Area has also been reorganized into two Project Streams: "CloudCO" that includes all the activities related to CloudCO architecture and "Cloud Components" that includes all the activities related to Cloud Infrastructure not necessarily CloudCO based.

- **Outcomes**

The SDN/NFV Work Area has received great input on a number of specifications and continued to progress work on:

- 'YANG Modules for Network Map & Equipment Inventory' (TR-454) has been published.
- 'Metro Compute Networking (MCN): Use Cases and High-Level Requirements' (WT-466) has completed the Straw Ballot process and is in Final Ballot. There is a call for contribution for a marketing document.
- 'vOMCI for New Access Nodes' (WT-451) Straw Ballot comment resolution continues and

the goal is to publish Issue 1 by the end of the year, together with WT-383a5.

Phase 2 of 'Metro Compute Networking Architecture and Functional Modules' is being discussed, following WT-466 moving to Final Ballot. Work also continues to progress on 'SDN Management and Control Interfaces for CloudCO Network Functions' (WT-413i2), 'CloudCO Enhancement - Access Node Hardware Disaggregation' (WT-477) and 'Access Network Abstraction, Softwarisation and Disaggregation' (WT-484) related to OB-BAA Open Source activities. Work on WT-477 is proceeding by adding FANS implementation option, call flow for Virtual DBA, protocol specification and a way forward for ONU specification. Finally, a contribution identified some gaps in YANG data model for FANS (Fixed Access Network Sharing), so it was agreed to open a new NPIF to close those gaps.

On the Artificial Intelligence and automation fronts, work continues on WT-486, which builds on the Automated Intelligent Management Framework specification TR-436 previously approved. While this is a different Project Stream within SDN/NFV Work Area, network automation and low-maintenance operations are imperative for simplifying network validation and engineering, streamlining network deployment and upgrades, and improving operations with less error-prone and automated OAM in the CloudCO environment. This will also automate some management functions and help realize rapid troubleshooting and pre-emptive maintenance.

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

## WWC progresses several specifications to enhance 5G support



- **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 WWC Work Area is finalizing a number of specifications to complete the second phase of specification development. Several specifications entered Straw Ballot at the end of the Q3 meeting. With this work, the group looks to subsume more of the capabilities of the 5G architecture.
- **Outcomes:** A set of new capabilities and enhancements will be published by the end of the year.

Work in the WWC Work Area has transitioned from completing the basic set of specifications to focusing on topics that bring more value to 5G for wireline and provide operators with increased flexibility, revenue potential and deployment options. The goal is to increase the service capabilities of the network to allow operators to fully leverage convergence of their networks while at the same time giving them more paths to transition their networks from legacy to 5G. 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.

The scope of the second phase work provides updates to TR-456 (Access Gateway Function Functional Requirements), TR-470 (5G Wireless Wireline Convergence Architecture) and TR-124 Issue 6 (Functional Requirements for Broadband Residential Gateway Devices), as well as planning to issue two additional specifications WT-457 (FMIF Functional Requirements) and WT-458 (CUPS for 5G FMC), both of which expand the deployment options for 5G WWC.

With the finalization of these documents in progress, the group is now discussing what the focus should be for subsequent work and held a brainstorming session as part of the Q3 deliberations. One key piece of work already identified is the OB-5WWC project designed to get 5G into the CPE open source food chain.

Broadband Forum continues to specify how to extract more value from the available feature set from 3GPP in the context of expanding legacy device support, being able to monetize the additional network functionality 5G brings to the table and expanding the overall addressable market for convergence. The group is currently incorporating technology from the 5G system into our specifications to realize a variety of Use Cases. These range across a broad spectrum and include topics such as hybrid access, enhanced work from home, access sharing scenarios and convergence of voice with the mobile system.

The group continues to expose the industry to the latest WWC work and its most recent webinar broadcast in May focused on [‘Bringing New 5G Services Inside the Home with 5G-Residential Gateways’](#).

Broadband Forum is taking an important role in developing 5G, continuing the productive cooperation with 3GPP, and making recommendations for the connection points between the fixed and 5G mobile core networks in order to drive core convergence.

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



## Welcome to our new and returning members!

Broadband Forum welcomed 250 registered attendees including more than 20 first-time attendees at the annual Q3 meeting. A number of new members and guests were unveiled, highlighting the continued importance of the quarterly meetings in bringing together key players from across the globe. [Aprecomm](#), [DISH](#), [AXON Networks](#), [BISDN](#) and [WISI](#) were among the new members welcomed at the meeting. The 12 guest companies were [Ayla Networks](#), [Capgemini Engineering](#), [Cloud Agility](#), [Compal Broadband Networks](#), [Cox Communications](#), [Iskratel](#), [Leonet](#), [Marvell](#), [Momentum Telecom](#), [RedMax Technologies](#) and [Roku](#). WISI Communications was also an auditing member guest.

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.

We have a range of membership options for companies of all sizes, from startup companies to large corporations and not-for-profit organizations. Our new Regional [Operator Membership category](#) has further opened participation, take a look for further details of the access level privileges, benefits and requirements.

To learn more about the benefits of membership, watch the video interview with Rhonda Heier, Director of Membership Development, as Rhonda discusses the value of the Broadband Forum membership [here](#) or email [rheier@broadband-forum.org](mailto:rheier@broadband-forum.org) for more information.

**5G, QED, Mbps and the Connected Home among the blog topics this quarter**



Revolutionary – and standardized – technology like the Broadband Forum’s TR-069 protocol and its successor, the User Services Platform (USP/TR-369), has driven this progress for operators, developers, and consumer electronics manufacturers all looking to add value to the connected home. For manufacturers and designers, there has always been a distinct advantage to having your product certified as meeting the industry standard and the same remains true today. **Jason Walls of QA Cafe and Chair of the Broadband Forum Connected Home Council** addresses several questions that arise to those considering certification: [What are the key advantages of doing so? Do the benefits outweigh the effort involved?](#)

Broadband Forum’s Broadband Quality Experience Delivered (Broadband QED) looks beyond conventional measurements to improve overall broadband experience and improve management of network latency, consistency, predictability and reliability. It’s helping give users what they want; seamless broadband connectivity, so that their applications can work optimally. **Domos CTO Magnus Olden** [discusses whether your network can handle a HD Zoom call.](#)

**Olden** also presents [an economic argument for moving away from Mbps](#) and advises why a mathematical framework for network quality should pique the interest of Telecom CFOs. By measuring the network quality better, improved telecom finance models can be created. Also this quarter, the ‘Bringing new 5G services inside the home with 5G-Residential Gateways’ webinar brought together the leading lights in the service provider and vendor community and those individuals that play a crucial role in contributing to the standards work across the globe. The insightful webinar delved into key use cases and aspects unique to Wireless Wireline Convergence (WWC) and enabling new services for devices in the home. **David Allan, WWC Work Area Director and David Woolley, Outstanding Contributor for the BUS Work Area at the Broadband Forum** discussed this in the [latest blog](#).

## Broadband Forum in the news



**Cover Story**

### The high-speed home

Our annual survey looks at the evolving role of CPE. Some providers want to shift the CPE workload to the cloud, while others think the Smart Home and the Internet of Things mean a sophisticated demand for a sophisticated Home Gateway.

**How** have consumers perceived the role of CPE? Some providers want to shift the CPE workload to the cloud, while others think the Smart Home and the Internet of Things mean a sophisticated demand for a sophisticated Home Gateway.

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Following an annual survey, it was found that some providers want to shift the customer-premises equipment (CPE) workload to the cloud, while others think the Smart Home and the Internet of Things (IoT) mean a continuing demand for a sophisticated home gateway. EuroMedia Magazine discussed the high-speed home and the evolving role of CPE, speaking to a range of industry practitioners, including Broadband Forum’s Vice President of Strategic Marketing and Business

Development Craig Thomas. The [July/August edition](#) included questions on the impact of lockdown and home-working on home connectivity, the importance and future of voice control in CPE, and the right balance between Cloud and on-premises approaches, in order to maximize the value for service providers and their customers.

Addressing the Latin America market, Broadband Forum and QA Cafe's Jason Walls [took part in TeleSemana's annual BCN LATAM SUMMIT](#). Delivering a presentation on 'The New Connected and Managed Home', Walls addressed how the managed connected home has evolved for operators and how USP is meeting challenges and delivering new ways to monetize the connected home.



In the latest edition of [North African Wireless Communications](#), Thomas provided a comment in an article entitled 'Why is broadband connectivity still a problem in Africa?' and discussed the expectation of what broadband is when internet connectivity is limited to 3G and 4G. Thomas argued that the need is clear to invest once, with one unified access network integrating all technologies and the final

access technology the only variable as the network can be built to accommodate next-generation access.

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## Events Calendar

### Broadband Forum Meetings and BAsE Events

#### Q3 2021

- September 10, 2021, FTTH Europe BAsE event, Virtual
- September 21-23, 2021, UFBB 21 BAsE event, Virtual
- September 23, 2021, Service Delivery State of Play vBAsE series, "Disaggregating and virtualizing the Network and Services", Virtual

#### Q4 2021

- October 12-14, 2021, BBWF BAsE event, Virtual
- October 24, 2021, BAsE North America, Virtual
- November 3, 2021, Service Delivery State of Play vBAsE series, Virtual
- November TBD 2021, Connected Home State of Play vBAsE series, Virtual
- November 29, 2021, BAsE ANZ, Virtual
- November 30 – December 3, 2021, Q4 Virtual

To register for our latest events, visit: <https://www.broadband-forum.org/meetings-and-events>.

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If you are interested in sponsoring a meeting, please contact Rhonda Heier at [rheier@broadband-forum.org](mailto:rheier@broadband-forum.org).

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**Contact information**

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