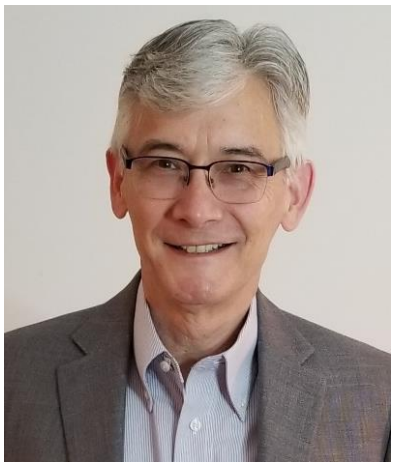
broadband forum

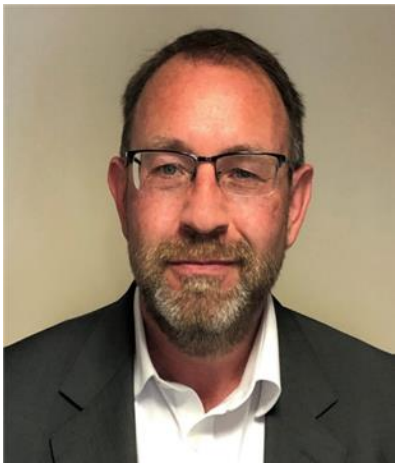
Shaping the Future of Broadband

WELCOME TO THE BROADBAND FORUM QUARTERLY NEWSLETTER

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

Leadership Team Update





Broadband networks have faced a rapid and unprecedented demand in recent years, and the attention has shifted to focusing on greater levels of Quality of Service and Quality of Experience rather than just high speed. This mirrors the quality and attentiveness from our members into each project and work, with the end-user at the heart of everything we do.

It has been great to see massive amounts of work ongoing and many projects proceeding to Straw and Final Ballot. A total of 11 documents were published in the 2nd quarter including six new Technical Reports representing five different Work Areas, as well as two Marketing Reports and three Test Plans and other documents. These documents include the first releases of TR-451 (ONU Management using Virtualized OMCI), TR-521 (5G Transport Architecture), and TR-522 (Mobile-transport network slice instance Management Interfaces). Six additional documents are in the Straw Ballot process. Notable strides were made within the Open Broadband projects with several releases published or nearing completion. Collaboration continues with standards organizations, including Wi-Fi Broadband Association, HomeGrid Forum, ITU-T, ETSI and CCSA, and MoCA Alliance.

This year we continue to grow from our 10 year high in membership and have already welcomed 15 new members to the BBF family with a great mix of global brands, innovative new technology vendors and Tier 1 and Tier 2 operators. We are also working with global organizations, including Fiber Broadband Association and Brekko, to ensure that the wider operator market has full visibility of our published work and benefits from our industry education programs.

We welcomed 8 new members and 19 guest companies to our Q2 meeting. Looking forward, we are excited about the prospect of moving back to in-person meetings in September. Over the past two years we have missed seeing you face-to-face as we discuss and collaborate on ongoing projects. While we encourage everyone to attend the Q3 meeting in person, we will also provide remote access for those who are unable to travel.

Our UFBB BASe event is returning in-person the week before the Antwerp Q3 meeting on September 7-9 in Den Haag, the Netherlands and is an excellent opportunity for members to be involved in two leading Forum events in one trip alone!

Our Q2 meeting was virtually situated in the picturesque Banff, Canada. Next up is Antwerp and we couldn’t be more excited to see many of members face-to-face in September. Registration to attend will open soon, and we hope to see you there!

Broadband Forum launches app-enabled services gateway project to revolutionize service providers' business plans

The demand for better network services and faster innovations has presented operators with a distinct opportunity to look towards end-user network gateways such as Wi-Fi routers as a platform to unlock a myriad of third-party applications and services.

The app-enabled services gateway project from Broadband Forum helps service providers effectively deploy, activate and manage third party applications such as parental controls, Wi-Fi analytics, streaming services and security solutions to consumers on a centralized Internet gateway device or other Customer Premises Equipment (CPE). Service providers can also differentiate and scale their business models to provide a more customizable offering to each subscriber.

"As networks and consumers move into a post-sufficiency bandwidth world there is an emerging opportunity to leverage the potential of the CPE as a platform for serving the needs of end-users and suppliers," said Oliver Johnson, CEO at Point Topic. "The exploitable functionality, properly managed and integrated, of an additional app like service layer right at the edge of the network will allow more control and better resilience for all the players in the ecosystem and improve choice and the overall experience for customers, the ultimate arbiters of any change."

Read more: https://www.broadband-forum.org/2022-06-26-broadband-forum-launches-app-enabled-service-gateway-project-to-revolutionize-service-providers-business-plans.

Broadband Forum in major cloud-native network cost breakthrough for operators worldwide

Operators globally now have the tools to flexibly plan and build their cloud-native networks and deliver faster services to their customers, thanks to Broadband Forum publishing Release 5.0 of its Open Broadband – Broadband Access Abstraction (OB-BAA) open-source project.

With the Network Function Virtualization (NFV) market expected to reach $122 billion by 2027, the latest release is another step that enables service providers to welcome the benefits of cloudification to their networks, but just as importantly, it offers a migration plan from their existing network investments.

"Operators continue to integrate their processes with cloud-native ecosystems and embrace virtualization to build and scale their networks while making sure that these new network architectures are compatible with their existing infrastructure," said Craig Thomas, Vice President Strategic Marketing and Business Development at Broadband Forum. "This news will deliver on the promise of next-generation broadband, while reducing service providers'

costs and protecting their investments at the same time. It is a major step in the deployment of cloud-native networks."

Find out more here: https://www.broadband-forum.org/2022-05-17-broadband-forum-in-major-cloud-native-network-cost-breakthrough-for-operators-worldwide.

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BASe industry education and events maintains pace in 2022

BASe 2022 continues the success of previous years and Q2 has been an exceptionally busy time. Since our last quarterly meeting, we have held five webinars, our 3-day virtual State of Broadband Summit and two face-to-face workshops at industry conferences.

BASe sponsorship is at an all-time high with currently 20 platinum and gold sponsors. We are excited by the number of returning and new sponsors, and the high level of thought leadership they bring to our events.

Through our virtual BASe (vBASe) events and Knowledge vBASe events it is exciting that we continue to drive such a high number of attendee registrations and experience a significant amount of post event downloads, as well as live attendees. If you have ever missed any of our vBASe webinars, you can always download recording of them at https://www.broadband-forum.org/category_meetings_and_events/past-base-events.

In May, we held our second ever vBASe "State of Broadband Summit" with a full agenda over three days. We continued the success of the 2021 event and increased the number of attendees who gained insights across our three main BASe tracks (Connected Home, Broadband Access and Fixed and Mobile Network Service Delivery). In total we had 20 expert panelists and speakers, and insightful roundtable Q&A sessions across the whole three days.

2022 is really the year we move back to more face-to-face meetings and we held our second workshops at the Fiber Broadband Association's Fiber Connect event in Nashville, as well as our first workshop partnering with Brekko in Wiesbaden, Germany. Across both days we attracted a very rich number of panelists, and the interaction during the workshops and the breaks prove that nothing can replace that in-person return to our industry education.

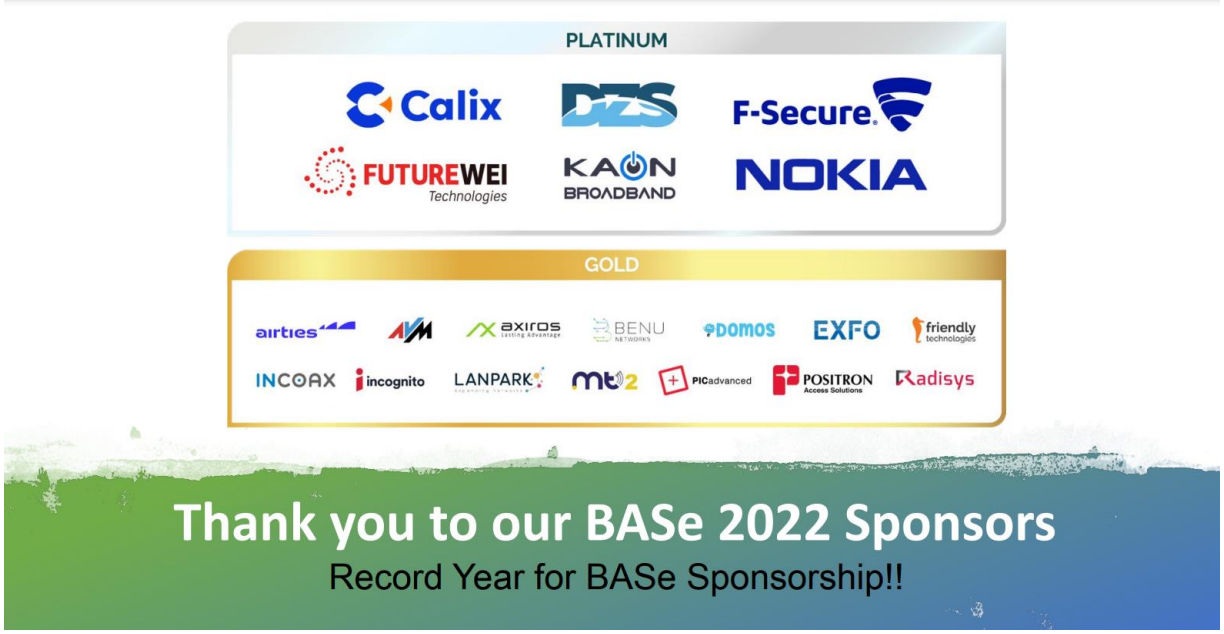
The whole BASe team would like to thank our sponsors, service providers, trade associations and attendees who travelled to these workshops and made them such a great success.

As we move into the Northern Hemisphere summer months, the momentum doesn't stop with new webinars. BASe Asia beckons and planning is underway for our UFBB event that will once again return to face-to-face in the Netherlands from September 7-9. UFBB is a great precursor ahead of welcoming our members back to in-person quarterly meetings during the Q3 meeting in Antwerp the following week.

Interested in speaking at UFBB? Please email the team at info@broadband-forum.org or you can attend by registering for UFBB here: https://www.ultrafastbroadband.nl/.

To find out more information on BASe events, sponsorship and speaker opportunities, visit here. If you want to catch up on the latest Broadband Forum webinars, download the respective recording and slide decks here.

Thank you to our New BASe 2022 sponsors!



Thank you to our Q2 Meeting sponsor, F-Secure!

We kicked off our Q2 2022 Opening Plenary with a presentation from our meeting sponsor, F-Secure, on the evolution of the threat landscape and the need for new cyber security solutions. The cyber security company is aiming to simplify the security business for its service provider partners and consumers in their home environment.

VP Network Security Business, Dmitri Vellikok highlighted the importance of the compatibility of F-Secure's products and the influence of Broadband Forum's industry Standards. Vellikok

revealed that Broadband Forums standards, such as USP and TR-069, has allowed F-Secure to create new product functionalities for its partners. The compatibility of products benefits its partners financially and allows its service providers to implement and deploy products quickly to create a brilliant, but simple user experience.

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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 - Goin' Mobile (Transport & Routing)

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:

- Mobile Transport & Routing Project Stream - WT-521 5G Transport Architecture and Requirements - passed Final Ballot! Document to be posted shortly on the Broadband Forum website.
- Mobile Transport & Routing Project Stream - WT-522 MMI - passed Final Ballot! Document to be posted shortly on the Broadband Forum website.

Progress:

- Q1-Q2 2022 conference calls abbreviated over the summer. Two for PEAT PS and MT&R PS, one for the AA PS. Stay tuned to the ATA email list and calendar for the call details.
- Mobile Transport & Routing Project Stream - MD-522 MMI - in Straw Ballot! Comments to be resolved after the Q2 2022 meeting.
- Access Architecture Project Stream - Progress on all DBNG projects between Q1 and Q2 2022. WT-459i2 nearing Straw Ballot. Overflow continues via interim calls.
- Access Architecture Project Stream - Subscriber Session Steering project continuing YANG data modeling project (YMSSS) for the entities and relationships defined in WT-474 offline via BitBucket.
- Performance, Experience, Application Testing Project Stream - Work continues on Quality Attenuation with WT-452.2 nearing Straw Ballot after Q2 2022.
- ATA Marketing Group - See Join or Leave BBF Groups and Email Lists to subscribe.

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

Key projects continue to progress at pace for BUS Work Area

Target: Progress on standards that enable a containerized, app-enabled subscriber network and subscriber network devices for operators to quickly realize and deploy new revenue generating services. More progress on enabling the 'App-Enabled Services Gateway'.

Outcomes: WT-181 Device:2.16 and WT-369 are on track to be released by Q4 2022. Look for publication dates for WT-488 and WT-492 soon.

The Broadband User Services Work Area has aligned all of its work around enabling the 'App-Enabled Services Gateway' and the fully Operator Managed End-User Network. WT-181 Device:2.16 and WT-369 Amendment 3 (USP 1.3) will include improvements to well-developed features like Software Module Management (SMM) and new features that allow USP to be used as a platform for deploying applications and microservices within end-user network devices. Work progressed on key architecture definition documents including WT-488, 'Architecture and Requirements for End-User Networks', and WT-492, 'Software-Based Architecture for an App-Enabled Services Gateway', both are targeted for operators, manufacturers, and even app developers looking to build interoperable solutions in this space.

WT-124 Issue 8, which defines requirements for Residential Gateways, will be published by Q3, collecting requirements specified by the Fiber Access Network (FAN) Work Area for GPON ONT CPE and further 5G fixed wireless updates.

In addition, the next version of WT-398, which defines performance metrics for the BBF.398 Certification Program, is on target for publication in Q1 2023. More devices are getting this certification every day that prove their products qualify as "carrier-grade" for operator's end-user networks.

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

Fiber to the Distribution Point (FTTdp) management capabilities upgraded with TR-355 Amendment 4

- **Target:** Specify YANG modules that are applicable to multiple Work Areas, provide support to those same Work Areas for their specific YANG projects, and maintain YANG Best Current Practices, processes, procedures, and tools.

- **Progress:** Feedback from the community driving the next Amendment of WT-383 via enhancements for existing YANG models, as well as providing new modeled methods for solving the scale puzzle.

- **Outcomes:** Enhancements for VLAN sub-interface profiles and transceivers were agreed with proposed YANG changes now under review for inclusion in the next Amendment. A new project was initiated working with the MoCA Alliance on YANG Modules for MoCA Access 2.5.

The Common YANG Work Area continued to make good progress on its key project deliverables.

TR-355 Amendment 4 'YANG Modules for Fiber to the Distribution Point (FTTdp) Management' was published in late May 2022. This amendment adds management of new features provided by ITU-T G.997.2 Amendment 3 'Physical Layer Management of G.fast Transceivers'. Additionally, all YANG modules were reviewed and modified to better align with OD-360 'BBF YANG Best Practices'. This provides a more consistent user experience across the YANG data models provided by the various Broadband Forum YANG projects.

Work on Amendment 6 continues to move forward, with several contributions accepted. This focuses on two key areas, the continued development of VLAN sub-interface profiles that address scale in large networks and resolving issues found in the hardware transceiver model. Both areas are sourced from the practical deployment of the TR-383 YANG modules and are indicative of the feedback loop that is essential to ensure our work is properly aligned across various use cases and operator deployments.

A joint review was held with the SDN/NFV Work Area to review the updated proposal for YANG modules for Northbound Interface (NBI) abstraction. Agreed to pursue a new project to develop this work within Common YANG with support from other Work Areas.

Finally, a New Project Initiation Form (NPIF) for YANG Modules for MoCA Access 2.5 was reviewed. The Work Area approved moving forward with the project which will be WT-496.

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.

Key progress across the Project Streams rounds off FAN-tastic quarter

Target: The Fiber Access Networks (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 Interoperability, and compliance Test Plans related to XGS-PON, NG-PON2 and PMD/TC Layer. Lastly, it is responsible for ITU and IEEE PON YANG data model specifications.

In Progress:

Unassigned Project Stream

In the last quarter, the Unassigned Project Stream continued with:

- Working Text development of WT-142 Issue 4 Framework for CPE WAN Management Protocol (CWMP) and USP enabled PON devices. Work is progressing well on aligning WT-142 Issue 4 with relevant technical specifications. Past contributions have included updating WT-142 to align with the latest PON specifications (e.g., adding EPON/SIEPON requirements and migrating RG specific requirements to TR-124).
- Working Text development of WT-489 Issue 1 ONU Authentication and Selection of eOMCI or vOMCI. Contributions included D-OLT ONU authentication, support of LOID authentication and requirements for all scenarios related to ONU authentication.
- Multi-management study on how to manage multiple management domains (e.g., OMCI and USP).
- The impacts of High Speed PON on existing Broadband Forum Technical Reports and Test Plans. The impact study has been concluded.

During the virtual meeting, the Unassigned Project stream reviewed additional contributions:

- WT-142 contributions related to handling of shared resources between multi-management domains (discussions have led to noting how bootstrapping a multi-management domain is desirable and this will be further studied in the multi-management domain study and WT-142).
- WT-489 contribution included one that finetuned past contributions. The FAN group discussed relaxing WT-489 and WT-385 requirements for physical OLTs that perform ONU authentication locally.

Interoperability Project Stream

In the last quarter, the Interoperability Project Stream started:

- DTP-255 Issue 2 GPON Interoperability Test Plan which updates TR-255 test cases with more recent TP-247 Issue 4 test cases.

During the virtual meeting, the Interoperability Project Stream reviewed additional contributions:

- DTP-247 Issue 4 candidate test cases to include in DTP-255 Issue 2.
- DTP-247 Issue 4 Corrigendum 1 status of test cases. It was decided at the virtual meeting that DTP-247 Issue 4 Corrigendum 1 test cases would be prepared for Straw Ballot. OMCI script update impacts will be studied while DTP-247 is prepared for Straw Ballot.

PON Management Project Stream

In the last quarter, the PON Management Project Stream continued with:

- WT-385 ITU-PON YANG Management Issue 2 Amendment 1 work. Contributions included support of WT-489 ONU authentication.

Outcome:

- DTP-247 Issue 4 Corrigendum 1 PON Conformance Test Plan will be prepared for Straw Ballot at the Q3 meeting.
- High Speed PON study impact was concluded and the impacted Broadband Forum FAN areas were identified.

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

PHYtx Work Area publishes TR-419 Issue 2 and TP-337 Issue 4

Target: To help service providers deploy equipment that will provide a better Quality of Experience (QoE) for their end-users.
Progress: Resolved the technical Straw Ballot comments on the Working Text of 'Reverse Power Feed Testing Issue 3' (WT-338i3).
Outcome: Published the next issues of 'Fiber Access Extension over Existing Copper Infrastructure' (TR-419i2) and 'G.fast Certification Test Plan' (TP-337i4).

The PHYtx Work Area published the next issues of 'Fiber Access Extension over Existing Copper Infrastructure' (TR-419i2) and 'G.fast Certification Test Plan' (TP-337i4).

TR-419i2 brings new use cases addressing bonded G.fast backhaul and G.hn Access in Multi-Dwelling Unit (MDU) environments for living units where crosstalk between lines may exist.

These additional use cases give operators more choice to roll out high bitrate services quickly, without the need to bring fiber into the home.

TP-337i4 brings increased certification coverage on the 'HLOG Accuracy' test parameter, the 'Robust Management Channel (RMC) tone masking configuration' and 'RMC recovery (RMCR)'. The certification now also includes verifying the correct reporting of the used G.fast profile and use of the 106b profile.

All technical comments provided during the Straw Ballot review of "WT-338i3 Reverse Power Feed Test Plan" were addressed this meeting. The remaining editorial updates will be handled in the coming weeks, as the document is prepared for Final Ballot approval at the Q3 Broadband Forum Meeting. This issue adds testing of reverse power feeding over coaxial cable deployments, according to ETSI TS101 548-2.

The Plugfest to obtain the WT-476 'G.hn Access Performance Test Plan' pass/fail metrics has been moved out to the third quarter of this year. The goal is to align with the Beta-test of the GHNA Certification Program from the HomeGrid Forum (HGF). This ensures that the Test Plan is ready for Straw ballot review by the Q4 meeting.

For 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-451, MR-451 and MR-477 in last quarter

- **Target:** Define the Cloud Central Office (CloudCO) architecture using SDN, NFV, and cloud technologies to support network functions fundamentally redefining the architecture of access and aggregation networks and support the migration of SDN and NFV into all aspects of broadband networks facilitating the agile deployment of new 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 main activities currently ongoing are related to the disaggregation of the access node and to define the related interfaces. The "Cloud Component" Project Stream is continuing work Metro Compute Networking and Automated Intelligence Management.
- **Outcomes:**

The SDN/NFV Work Area published the following documents since the 2022 Q1 meeting:

- MR-477 on "Access Node Disaggregation"
- MR-451 on "ONU Management using Virtualized OMCI"
- TR-451 on "vOMCI Specification"

The SDN/NFV Work Area also continued to progress work to Straw Ballot comment resolution

related to WT-484 on 'Access Node Abstraction'.

Phase 2 of 'Metro Compute Networking Architecture and Functional Modules' has been started with a first proposal regarding the reference architecture to be included as starting point of WT-491 on 'Metro Compute Networking Architecture, Functional Modules and Interface Definitions'.

Straw Ballot of WT-477 on 'CloudCO Enhancement - Access Node Hardware Disaggregation' has been completed. The publication will be finalized once all the missing data models are created and approved by the Common YANG Work Area. The finalization of WT-477 will lead to inputs to WT-413 Issue 2 on 'SDN Management and Control Interfaces for CloudCO Network Functions' to complete the part related to disaggregated access node and flow control interfaces.

On the Artificial Intelligence and automation fronts, work continues on WT-486, which specifies the interfaces for the Automated Intelligent Management Framework specification TR-436 previously approved. The activity continued by specifying some relevant interfaces to connect the Decision Element with network elements and with the SDN Management and Control. While this is a different Project Stream within the 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.

A joint meeting between the SDN/NFV, FAN and Common YANG Work Areas dealt with a new proposal for the abstraction of northbound interfaces on a normalized YANG mount interface for disaggregated functions.

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

WWC continues Phase 3 specification work

WWC Wireless-Wireline Convergence

- **Target**: Address the needs of operators, which have wireline or mobile networks deployed so they can leverage their assets with combined subscriber offerings with a converged core.
- **Progress**: The WWC Work Area is progressing work on the third phase of specification development. It currently has two active Project Streams, the 5G Project Stream and IMS for 5G-RG Project Stream. With this work, the group continues to subsume more of the capabilities of the 5G architecture.
- **Outcomes**: Work continues on a new set of capabilities and enhancements with the latest specifications in progress for subsequent publication.

Work in the WWC Work Area has transitioned from improving the basic set of specifications in Phase 2 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 to a single 5G Core.

The group continues to incorporate capabilities from the 5G Toolkit 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. This work will allow converged operators to provide a uniform experience to their customers irrespective of the access or appliance they are using, supported by a common and streamlined back office and control plane.

The 5G Project Stream continues to progress two specifications, WT-457 (FMIF Functional Requirements) and WT-458 (CUPS for 5G Fixed Mobile Convergence), both of which expand the deployment options for 5G WWC. The new Project Stream addresses 5G-RG IMS Voice support, starting with work on the architecture and a profile for residential voice. Work is moving forward on WT-493 (IMS for 5G-RG Architecture) and WT-494 (IMS for 5G-RG Residential Voice Requirements). This key piece of work will converge legacy voice services onto the 5G system. With these two key baseline texts established, there is now an opportunity for all interested parties to contribute to this important work.

5G-RG Hybrid Access enhancements was also agreed as a Phase 3 study item. A joint session on 3GPP and non-3GPP device management requirements was held together with the BUS Work Area in the context of the Broadband Forum cooperation with 3GPP on the subject.

The group continues to expose the industry to the latest WWC work and supports the ongoing education and marketing activities, including the continued development of its webinar series. Catch up on the Quality of Experience in an Wireless Wireline Converged Network webinar that took place on March 17. The WWC Work Area has an upcoming webinar on September 27 to update the broadband industry on the IMS for 5G-RG progress.

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.

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 published the Essex Skipper 5.0 release in April 2022. The latest release is another step that enables service providers to welcome the benefits of cloudification to their networks, but just as importantly, it offers a migration plan from their existing network investments. The release includes work on policy-based authentication within the operator's cloud network of Optical Network Units (ONUs) as operators seek to deliver a seamless customer experience. This encompasses 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.

Release 5.0 also enhances the functionality for disaggregating the management of ONUs from the OLT into the operator's network with new features to handle ONU alarms. The additional enhancements to the virtual ONU Management Control Interface (vOMCI) solution were made in support of future Broadband Forum vOMCI Plugfests. The latest work provides enhancements and fixes to the existing OB-BAA software that scale testing for a single Optical Line Terminal (OLT) device, and has created more than 512 ONUs and connected and aligned 127 ONUs.

The OB-BAA project team is currently working towards Release 5.1 as we prepare for the Broadband World Forum demo later this year. This will encompass microservice discovery and integration with shared datastores and scale testing of 10,000 ONUs.

For more information about 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 prpl Foundation continue promising collaboration

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.

The OB-MAP project team has continued to collaborate with prpl team on requirements and feature prioritization, and data modelling of multiple devices and services in a mesh network. Progress has also been made on prplMesh's Northbound API (NAPI), and the group has been assisting with the use and definition of Broadband Forum's USP internal Messaging Transport Protocol (iMTP) in the context of prplOS.

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

Finishing touches on Falcon Release by OB-USP-Agent team

Current Efforts: The OB-USP-Agent team has been putting the final touches on its Falcon Release (Release 6) with a release date targeted for the end of June. This release incorporates key features related to the initial support for USP End-to-End Session Contexts. These features cover the USP Record Segmentation and Reassembly mechanism, USP Connect records, and the USP Disconnect record. This latest release also incorporates enhancements introduced in Version 1.2 of USP, the ones specifically related to the Get and GetSupportedDM message updates.

Future Plans: The team plans to begin scoping work for Release 7 in July.

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

Eighth release from the OB-UDPST project team adds new measurement algorithm for faster and reliable measurements

Current Progress: The OB-UDP Speed Test (OB-UDPST) project team delivered its eighth public release (7.5.0) on-time on May 6, 2022. This release introduces a new/optional Load Adjustment Algorithm for challenging circumstances, such as persistent competing traffic and non-congestion-related Loss.

The major new feature in this release, was anticipated by the version 9 protocol in release 7.4.0:

- Optional Load Adjustment (Search) Algorithm, Type C, briefly described as "Multiply and Retry"
- The "fast" ramp-up is now a multiplicative rate increase to congestion, reaching 1 Gbps in less than 1 second
- The "fast" ramp-up can be re-tried when conditions warrant to ensure that the Max IP-Layer Capacity is reached
- This algorithm supports a search over the full range of rates, even if the subscribed rate is more than 1 Gbps
- The Type B algorithm remains the default for testing that does not benefit from "Multiply and Retry" aspects

The new Type C Algorithm satisfies requests to support test durations of less than 10 seconds, and permits measuring the Maximum IP-Layer Capacity more reliably, even on Mobile access with more variability than Fixed access.

This release also includes an extended Sending Rate Table, which allows testing of access rates up to 40 Gbps.

Future Plans: Next steps likely include a supplemental release, 7.5.1, coming soon. This release will pick-up feedback from users of one of the earlier releases. Issue 3 of TR-471 plans to incorporate all of the improvements and features deemed useful in the OB-UDPST project.

Now that the Internet Engineering Task Force (IETF) has published RFC 9097: 'Metrics and Methods for One-way IP Capacity', the IP Performance Metrics Working Group has adopted the OB-UDPST protocol specification. The OB-UDPST project team will follow the IETF IP Performance Measurement (IPPM) development and comments closely.

For more information on the OB-UDPST project team's ongoing progress, please visit: https://wiki.broadband-forum.org/display/OBUDPST/OB+UDP+Speed+Test+Home.

open broadband

OB-5WWC project defines high-level software architecture in Q2

Open Broadband-5WWC (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.

Current Progress: A number of achievements have been made this quarter, including high-level software architecture being defined with key components and their roles identified. This includes developments on Control Plane Transport and the Wireshark enhancements for the specifications from the Broadband Forum. Wireshark is the industry-standard tool that is continually used by implementers.

High-level design for OpenWRT integration was completed, this includes the design for Unified Configuration Interface (UCI), ubus configuration and mapping configuration to TR-181. A formal development environment was defined, and exploration took place of the components for the end-to-end test environment, including AGF and 5G Core.

Next steps: The detailed design including WWCd as a key component will be addressed in the months ahead. The project team are hopeful that development will soon begin. This includes the solution design of the Control and User Plane transport including the Stubbed AGF test tool, and 5G Wireless Wireline Convergence User Plane Encapsulation (5WE), and the 5G controller providing registration and session management.

There is now an opportunity for interested parties to offer contributions to implement the architecture and component design already established. The project remains open to all interested parties, including candidates with software development experience in the C programming language, and radio module and mobile experience.

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.

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broadband forum member company

Welcome to our new and returning members!

There were 229 Registered Attendees at the Q2 Meeting, with more than 11 first-time attendees welcomed. Our new members included Airtel, Beegol, Elisa, Excentis, Hewlett Packard Enterprise, NetCologne, United Cloud and Wistron NeWeb.

Guest companies at the meeting were 1&1, Alachua County Florida, CityFibre, Elysian Fiber, Frontier Communications, Fibocom, GQG Consulting, Greenlight Community Broadband, Grupo Backbone, Int6tech, IPLAN, The Kingdom of Bahrain, Lamda Developments, National Chiao Tung University, Pocket Internet, Shentel, Veego, Vtal and Washington State Broadband Office.

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 for more information.

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YANG, USP 1.2, vBASe and multi-vendor interoperability were all topics for discussion in Q2

Joey Boyd and Sven Ooghe, Co-Directors of Broadband Forum's Common YANG Work Area teamed up to inform Broadband Forum readers how the Common YANG Work Area work is delivering greater interoperability to the broadband industry. They concluded that operators can deploy new technologies with renewed confidence and improved interoperability, thanks to YANG.

One of our latest blogs also explored one of fastest-growing standards for connected device management and control in the connected home industry. A blog by **Jason Walls, QA Cafe, Chair of the Broadband Forum Connected Home Council and BUS Work Area Director** discussed how USP 1.2 is unlocking the full potential of the connected home market.

Tiffany Groves, Marketing Coordinator at Broadband Forum and Rhonda Heier, Director of Membership Development at Broadband Forum revealed that Broadband Forum is hosting a combination of in-person and virtual BASe events, due to our growing number of BASe sponsors. The Broadband Acceleration Seminar (BASe) series will continue to focus on three main broadband ecosystem elements.

What is QoE and why does it matter? was the blog from **Craig Thomas, VP Marketing & Business Development at Broadband Forum** that outlined what we are doing for Quality of Experience and how it is different to Quality of Service. Wrapping up Q2 was a blog from **Jonathan Newton, Principal Network Architect at Vodafone's Fixed Access Centre of Excellence**. Jonathan told readers that WT-474 will deliver an open standards approach to the architecture and data models to enable network capability for flexible and dynamic real-time decisions about the placement of individual subscribers. Broadband Forum is currently working on WT-474, which is introducing Subscriber Session Steering and dynamic subscriber placement.

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Widening awareness: Participation in industry events

The 'Remote Gateway and Subscriber Network as a Platform: Why Now?' was the question asked by **Jason Walls** at TeleSemana's BCN LATAM SUMMIT. The Chair of the Broadband Forum Connected Home Council spoke at the main online telecommunications event for Latin America. Jason discussed the importance of agile and differentiated service offerings for operator success, and standards, open source and testing: the three pillars of valuable and interoperable technology. Watch the webinar to find out more.

Broadband Forum's **Craig Thomas** was called upon to speak at this year's FTTH Council Europe Conference. Craig took part in the 'In-home Broadband Excellence: A new world to discover' workshop, highlighting the importance and relevance of standards in the ever-evolving connected home. **Nikhil Shah** joined forces with senior leadership teams across leading networks as they outlined a roadmap for collaborative 5G opportunities and capabilities for the

digital transformation of India. The Broadband Forum Ambassador presented at the 5th Annual 5G India Leadership Summit 2022.

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Events Calendar

Broadband Forum Meetings and BASe Events

Q2 2022

- June 28, 2022, Fiber Access State of Play vBASe series, Virtual

Q3 2022

- July 7, 2022, Broadband Access vBASe, Virtual
- July 14, 2022, Connected User State of Play vBASe series, Virtual
- August 9-10, 2022, vBASe Asia, Virtual
- September 7-8, 2022, UFBB
- September 13-16, 2022, Broadband Forum Q3 Meeting, Location TBD
- September 22, 2022, Managed the Customer Service Experience/Connected User vBASe, Virtual

Q4 2022

- October 6, 2022, Network and Service Delivery State of Play vBASe series, Virtual
- October 18-20, 2022, BBWF
- November 3, 2022, Connected User State of Play vBASe series, Virtual
- December 5-8, 2022, Broadband Forum Q4 Meeting, Location TBD
- December 13, 2022, Broadband Access State of Play vBASe series, Virtual

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

Sponsorship opportunities are available for Broadband Forum's 2021 quarterly meetings and BASe events. Sponsoring Broadband Forum events 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.

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Contact information

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