Wireless-Wireline Convergence

Mission Statement

The WWC Work Area addresses the needs of operators, which have integrated, wireline or mobile networks deployed so they can leverage their assets with combined subscriber offerings with a converged core. It aims to deli ver more value with deployment options for integrated, wireline, and mobile operators and suppliers. It focuses on optimizing the Total Cost of Ownership by consolidating network, common control plane, and streamlined backend by a comprehensive, well-specified, deployed Wireless-Wireline-Convergence architecture and functions to deliver broadband services with the 5G Core.

The Work Area incorporates capabilities from the 5G toolkit to realize a variety of use cases, including topics such as multi-/hybrid access, enhanced work from home, access sharing scenarios and convergence of voice with the 5G system. 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 functional network convergence.

Work Area Directors: Christele Bouchat (Nokia), Manuel Paul (DT)

WWC Business Drivers, Relevance & Impact

The advent of 5G is seen by operators as an opportunity to converge the fixed and mobile side of their networks beyond structural convergence, where fixed and mobile functions coexist over a shared infrastructure (e.g., Cloud CO). In particular, functional convergence provides a single control plane for wireline and wireless sessions. Motives for convergence are varied but include:

- Offering customers a seamless, access-independent, consistent service experience
- Enabling multi-access connectivity
- Streamlining the set of network functions and processes required to operate their network
- Simplified OSS/BSS and network operations
- Common technology, on-boarding, training and services between fixed and mobile divisions
- Enabling common subscriber management
- Extending the geographical reach of 5G core networks
- Extending the service offering with fixed access networks

In addition, the consolidation of all services and subscriber management onto a single system leveraging the 5G Core enables:

- The network as an access independent digital platform
- Access independent models for differentiated services
- New advanced capabilities like differentiated Quality of Experience for services
- Common set of B2B interfaces and a rich ecosystem



Wireless-Wireline Convergence Email List:

- wwc@broadband-forum.org: WWC meeting notification, agendas, discussion, etc.
- Join or Leave BBF Groups and Email Lists
- Go to your Jira profile page to see all of your current BBF group memberships.

WWC Meetings:

- WWC Teleconference Calendar
- All BBF Teleconferenc e Calendar

Quick Links:

The principle impact on the market addresses the ability to create seamless connectivity via wireline and/or wireless access for residential, single or multi-tenant business locations that will radically improve users' network experience. This is the next step in the evolution from the automatic connectivity to available Wi-Fi networks and will become the norm with the advent of 5G. This work will allow converged operators to provide to their customers a differentiated Quality of Experience, with respect to different services and applications they are using, and enable to provide a consistent experience, irrespective of the access or appliance they are using, supported by a common and streamlined back office and control plane.

Scope

Wireless-Wireline Convergence (WWC) requires a substantial architecture and operation transformation, as some assets become shared, instead of being dedicated per access type. This transformation has to account for the large installed base of wireline subscribers, as a result, broadband line migration is a major aspect of 5G WWC Architecture.

The Broadband Forum works in cooperation with 3GPP to define how fixed access can integrate with the 5G core. The key concerns raised by operators and embodied in the work are:

1. The fact that no two operators will have the same starting point in the journey to 5G.
2. The need to eliminate as many dependencies as possible so that transformation steps can be implemented without major coordination between network domains.
3. The need for deployment flexibility in how 5G components are introduced into the network.

The 5G WWC architecture includes the set of functions and interfaces that realizes the use cases targeted by the BBF and 3GPP for the 3GPP Release 16 and beyond, including network functions for adapting wireline access onto the 5G Core.

It enables several deployment scenarios, which are described in this document, to support different network environments, starting points and priorities, with different cases in terms of Residential Gateway (RG) type, access networks and interfacing model with the 5G Core. As part of these scenarios, devices supporting 3GPP procedures, connected to the RG via the Wi-Fi in the LAN and/or over the RAN, may also access the 5G core network. Information elements that are common to multiple BBF specified functions in the 5G WWC architecture are defined.

Project Streams (PS)

Active Project Streams

Project Stream	Description	PS Leadership

Non-PS Assigned	Projects that don't fit under the scope of an existing Project Stream or if they fit under the scope of more than one Project Stream, are developed under the Non-PS Assigned category.	Christele Bouchat , Nokia Manuel Paul , Deutsche Telekom

Project Stream	Description	PS Leadership
5G	This stream addresses architecture between wireline and wireless networks, leveraging a converged 5G Core network, in cooperation with 3GPP, aligned with 3GPP release plan.	Venkatesh Padebettu , Juniper

Project Stream	Description	PS Leadership
IMS for 5G-RG	Provide a profile of IMS behavior suitable for RGs attached to a 5G system, designed to maximize operational and procedural commonality with practices and the architecture of voice services in the mobile network.	Roland Schott , Deutsche Telekom AG

Project Stream	Description	PS Leadership
Multi-Tenant FWA	Driven by use cases, the project stream defines architecture and requirements for serving multiple tenants within a Multi-Dwelling Unit (MDU) can be efficiently served with broadband connectivity via - FWA through a converged or pure 5G network approach. The work is based on the FWA Extension pro ject NPIF.	Mike Talbert, WNC

Completed PS

Project Stream	Description	PS Leadership
Converged Policy and Control		Frederic Klamm, Orange

Project Stream	Description	PS Leadership
Hybrid Access	This stream addresses broadband services over dual accesses (wireline and wireless).	Guiu Fabregas Segales, Nokia

Active WWC Projects

WT /MD /SD#	5G PS Projects	Abstract	Related Contributions	Editor (s)
WT-456i3	AGF Functional Requirements	Issue 3 of the AGF Specification	Contributions	Christele Bouchat Jonathan Newton
WT-458 Issue 2	AGF CUPS	Wireless and Wireline Convergence with Control and User Plane Separation - Reference Architecture, Interface, and Protocol Specification	Contributions	Kenneth Wan
WT-470i3	5G Wireless Wireline Convergence Architecture	5G Wireless Wireline Convergence Architecture Issue 3	Contributions	Christele Bouchat Manuel Paul

WT/MD /SD#	Multi-Tenant FWA Projects	Abstract	Related Contributions	Editor(s)
WT-507	Key Issues on FWA Extension	FWA solution for delivery inside a MDU/MTU	Contributions	Helge Tiainen Michael Timmers

WT/MD /SD#	WWC Marketing	Abstract	Related Contributions	Editor(s)
MD-470	Value of WWC	FWA solution for delivery inside a MDU/MTU	Contributions	Juan Luis Esteban

Completed WWC Projects

WT /MD /SD#	5G PS Projects	Abstract	Related Contributions	Editor (s)

TR-457	FMIF Functional Requirements	WT-457 provides a detailed specification of the 5G-FMIF and its functional requirements that are necessary to support the interworking between the BBF wireline access networks and 3GPP 5G networks and to enable FN-RGs to use services that are based on 3GPP 5G core network.	Contributions	Mengmeng Li Donald Eastlake
TR-458	CUPS for 5G FMC	This project specifies Control Plane (CP) and User Plane (UP) Separation (CUPS) requirements to support 5G Fixed Mobile Convergence (FMC).	Contributions	Kenneth Wan Donald Eastlake
TR-470 Issue 2	5G Wireless Wireline Convergence Architecture			Christele Bouchat Manuel Paul
TR-456 Issue 2	AGF Functional Requirements			Christele Bouchat Jonathan Newton
TR-124i7	Functional Requirements for Broadband Residential Gateway Devices			
TR-124i6		A 5G-RG will be a residential gateway fully compliant with the Wireless Wireline Converged (WWC) 5G Core described in SD-407 (BBF) and 23.716 (3GPP).	Contributions	Klaus Wich
TR-181 Issue 2 Amendment 13	Data model support for 5G-RG	WT-181i2a13 Issue 2 defines version 2 of the Device data model (Device:2).	Contributions	Klaus Wich
TR-470	5G WWC Architecture	End-to-end architecture view also known as the "Rosetta Stone" for WWC.	Contributions	Christele Bouchat Manuel Paul

TR-456	AGF functional requirements	The scope of this working text is to describe the functional requirements of the Access Gateway Function (AGF). The AGF resides in between the aggregation network of fixed access nodes such as OLTs or DSLAMs, the V-interface (specified by BBF TR-178) and the 5G Core network (specified by 3GPP). It serves both FN-RG as well as 5G-RG.	Contributions	Christele Bouchat Jonathan Newton

WT/MD /SD#	IMS for 5G-RG PS Projects	Abstract	Related Contributions	Editor (s)
TR-493	IMS for 5G-RG Architecture	IMS for 5G-RG Architecture	Contributions	Roland Schott
TR-494	IMS for 5G-RG Residential Voice Requirements	IMS for 5G-RG Residential Voice Requirements	Contributions	Jörgen Axell

WT /MD /SD#	Hybrid Access Projects	Abstract	Related Contributions	Editor (s)
WT-378	Hybrid Access Nodal Requirements	The purpose of is to define nodal requirements in support of TR-348 Hybrid Access broadband networks, which will enable service providers to offer higher throughput and reliability services to their subscribers by means of simultaneous use of fixed broadband and 3GPP access networks.	JIRA contributions	Guiu Fabregas Segales, Nokia

WT /MD /SD#	(Archived)	Abstract	Related Contributions	Editor (s)
SD-357	Combined 3GPP and BBF Functions	This document contains the results of the study on 3GPP-BBF Common Functions, that is performed in a stepwise approach, addressing the following business needs: 1 – Identification of common network functions between the 3GPP and BBF domains is a necessity 2 –Analysis of virtualization aspects of identified common functions, as an enabler for future study in the area of Virtualized Network Functions (VNFs) and Network Function Virtualization Infrastructures (NFVI), destined for mobile and fixed networks. The results of this work in the BBF serve as a foundation for further collaboration opportunities with the 3GPP and with the ETSI ISG NFV.		Frederic Klamm, Orange

SD-406	End-to-End Network Slicing	The purpose of this study is to investigate the concept of network slicing with respect to the BBF MSBN architecture. Network slicing is considered as a fundamental enabler the BBF MSBN needs to support in order to move from the paradigm of “one architecture fits all” to the logical “network per service”. Network slicing will enable value creation for vertical segments that lack physical network infrastructure, by offering network and cloud resources.		Konstantinos Samdanis, Huawei Technologies
SD-407	5G Fixed Mobile Convergence	The purpose of this study is to find common interfaces for the AN and CN, to support converged wireline-wireless networks that use the 5G CN. This project will study N1, N2 and N3 interfaces and provide detailed feedback to 3GPP in the context of 5G Fixed (as recommended by the joint 3GPP-BBF Workshop), to let 3GPP evaluate how to proceed with this as swiftly as possible. This project will specify of a 5G Access Gateway Function (AGF) that adapts fixed access onto the 5G core, and then consider and specify several architectural deployment options as well as the underlying infrastructure sharing aspects. It will also devise strategies and develop specifications to address a desire by a number of operators for interworking of existing fixed access subscribers and deployed equipment into a 5G core. With the outcome of this project, BBF will provide recommendations for 5G system architectural and functional integration related to highlighted/identified convergence items during the joint 3GPP-BBF Workshop.		Peng Shuping, Huawei Technologies Christele Bouchat, Nokia
SD-420	5G Fixed Mobile Convergence Study	5G Fixed Mobile Convergence Study (External). Addresses considerations and challenges on unified CUPS protocol for CloudCo and WWC.		