WIRELESS
BROADBAND ALLIANCE
DRIVING NEXT WIRELESS EXPERIENCE

WBA PROGRAMME OVERVIEW

2017 Programs and Projects

THE WBA MISSION

Founded in 2003, the Wireless Broadband Alliance (WBA) works tirelessly to champion the development of a converged wireless broadband ecosystem; through the seamless, secure and interoperable unlicensed wireless broadband services, and enable outstanding user experience for more than 2 billion global subscribers through our member operators.

Wi-Fi and unlicensed wireless have now become a serious part in the telecommunications field, and are stepping outside their traditional role of providing connectivity to consumers toward vertical market specific sectors such as Cities, IoT service platforms, etc.

Interoperability and security between different technologies is rapidly becoming a key requirement in developing new services.

Wi-Fi is poised to play an important role in the development of 5G. The adoption of Next-Generation Wi-Fi services will need the coexistence and convergence of unlicensed and licensed networks in order to have significant impact on the future of wireless communications.

WIRELESS
BROADBAND ALLIANCE
DRIVING NEXT WIRELESS EXPERIENCE

LEARN

LEVERAGE

ENGAGE

INFLUENCE

BUILDING ON OUR PIONEERING NEXT GEN WI-FI FOUNDATIONS

The key activities of the WBA aim to address the ever-changing market requirements and opportunities through the following programmes and objectives:

ACCELERATING GLOBAL LEADERSHIP FOR WIRELESS SERVICE ENABLEMENT THAT IS SEAMLESS, SECURE AND INTEROPERABLE.

WBA ACTIVITIES

Services Enablement, Develop Guidelines and Standardization

End-to-end Interoperability, Fields Trials, and Roaming

Services Certification and Compliancy

PROGRAMS

OBJECTIVES

CARRIER WI-FI SERVICES
(includes Trials, Testing
and Interoperability, Certification)

Developing Wi-Fi & unlicensed wireless services to address the current and future needs of the customers

NEXT GENERATION WIRELESS
(5G and unlicensed)

Accelerate Next Generation Wireless service opportunities across existing and new ecosystems towards 5G

CONNECTED CITIES AND INTERNET OF THINGS

Driving the connected cities and IoT ecosystem through guidelines, best practices and development of public-private collaboration

POLICY, SPECTRUM & INDUSTRY ENGAGEMENT

Contributing to spectrum development and alignment across organizations worldwide, while driving industry engagement through events, executive sessions and regional workshops

As more and more people and devices are being connected, Unlicensed wireless, Convergence and Wi-Fi will play a critical role for all:

OPERATORS

CHIPSET MANUFACTURERS

SYSTEMS INTEGRATORS

OTT PLAYERS

IoT PLAYERS

HIGH-DENSITY VENUES

START-UPS

CITIES

EQUIPMENT MANUFACTURERS

LIST OF 2017 PROJECTS

1 - Carrier Wi-Fi Services
1.1 - Services Enablement, Develop Guidelines and Standardization
- Wi-Fi Calling
- Wi-Fi Deployment Guidelines
- NGH User Provisioning Standardization
- Quality of Service on Carrier Wi-Fi
- Security & Privacy over Wireless Networks
- Convergence of Cellular and NGH networks – ANDSF/ HS2.0 Policy (Guidelines & Trial)
- Location Based Services (LBS) and Advertising

1.2 End-to-end Interoperability, Fields Trials, and Roaming
- Testing & Interoperability Umbrella Group
- Carrier Wireless Services Trial
- WBA Roaming Standards

1.3 Services Certification and Compliancy
- Carrier Wireless Services Certification
- Interoperability Compliance Program

2 - Next Generation Wireless (5G and unlicensed)
- 5G
- Unlicensed LTE
- Multi-x or Multi Connectivity Trial

3 - Connected Cities & Internet of Things
- IoT Streams
- Connected City Blueprint

4 - Policy, Spectrum & Industry Engagement
- Policy Workgroup
- Coordinated Shared Spectrum

Wi-Fi Calling

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Wi-Fi Calling Extranet

PROJECT DESCRIPTION

Keywords
Wi-Fi Calling, Native Dialer, VoWi-Fi, VoLTE, Roaming, Emergency Services, Interworking Cellular <> Wi-Fi

Business objectives
• Harmonize Wi-Fi Calling architecture for best practice deployment
• Give more confidence to service providers to deploy Wi-Fi Calling

Project information

Wi-Fi Calling Opportunities and Challenges towards 5G - With the support from leading device vendors and leading operators globally, for Wi-Fi Calling, the momentum for Wi-Fi Calling in the industry is increasing rapidly. WBA provides an ongoing assessment of all critical factors regarding the implementation of Wi-Fi calling.

Wi-Fi Calling End-to-End System Standardization – WBA is addressing the identified gaps on previous work to develop a specification impacting all players in the ecosystem. This ranges from; Emergency Call Support, Location, Quality of Experience, Regulatory work, among others.

Outcomes / Target Audience

WBA looks into the opportunities of Wi-Fi Calling in the industry by producing guidelines documentation that will help the ecosystem including operators, service providers and device/infrastructure vendors currently exploring this opportunity. Furthermore, WBA is creating a Focus group to review technology, business case, risk, strategic alignment, among others.

MAIN AREAS COVERED

• What's Wi-Fi calling -
  Overview of Wi-Fi Calling Technologies
• Business Drivers, Market Opportunities and Use Cases
• Wi-Fi Calling Functional & Business Requirements
• What are the challenges/Impediments to Wi-Fi calling?
  (Business & Technical)

• Develop and deliver an end-to-end Wi-Fi Calling specification on which standards based solutions could be implemented and deployed
• Define the scope for Wi-Fi Calling interoperability trials that cover various deployment models and options providing inputs to the Carrier Wireless Services Trial Project

WBA RELATED WORK

Available for download from the Resource Centre >>

Wi-Fi Calling Opportunities and Challenges towards 5G

Wi-Fi Deployment Guidelines

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Wi-Fi Deployment Guidelines Extranet

PROJECT DESCRIPTION

Keywords
Wi-Fi Deployment, Installation, Design, Testing, RF management, Configuration

Business objectives
• Harmonize Wi-Fi networks for best practice deployment
• Give more confidence to service providers to deploy Wi-Fi networks

Project information

Nowadays, Wi-Fi deployments face several challenges that benefit from a collaborative industry effort to create a new level of efficiency, performance and reduced time-to-market. Given the inconsistencies in deployment methods and resulting differences in meeting end-user expectations, an industry-wide set of deployment guidelines will help ensure more a standardized approach in effectively deploying Wi-Fi networks.

This project defines an industry standardized approach encompassing different deployments phases across different types of environments:

1 Pre-installation guidelines
2 Design
3 Installation and testing
4 Configuration and operation

Outcomes / Target Audience

All in all, this guidelines document help operators making the best decisions when deploying their networks. Requirements are continuously defined in order to facilitate deployments decision process. Moreover, use cases from key operators and vendors will be included to facilitate comprehension on current deployments.

MAIN AREAS COVERED

1 Pre-installation guidelines
  • Site survey
  • Radio spectrum analysis
2 Design
  • Design objectives & KPI targets
  • Wi-Fi network design
3 Installation and testing
  • Channel management - objective of selecting the "best" Wi-Fi channel in a congested radio environment

  • Performance considerations - if a new AP joins already busy channels, might overlap existing AP's and perhaps have "more collisions", mitigation strategy
4 Configuration and operation
  • Devices provisioning - industry standard approach to onboard clients (e.g. new clients joining the network for the first time) independently of the device characteristics
  • Provisioning - Massive deployment of NGH/HS2.0 in Wi-Fi networks. What process should be followed to massively enable a footprint with HS2.0

WBA RELATED WORK

Available for download from the Resource Centre ≫

Carrier Wi-Fi Guidelines

NGH User Provisioning Standardization

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NGH Provisioning Standardization

PROJECT DESCRIPTION

Keywords
Inline Provisioning, Unauth EAP, Onboarding, Online Sign-up, Captive Portal

Business objectives
• Improve service experience for on-boarding of customer devices into NGH
• Remove barriers to service providers to invest in NGH

Project information

NGH Provisioning effort focus on Wi-Fi adoption and growth addressing the need the need for an industry standardized approach to: **discover a NGH network and related services, associate automatically and securely, be provisioned with network access credentials with minimal user interaction, and use the service without delay.** Such a flow would also reduce the friction to NGH adoption and simplify deployments by eliminating the need to use a separate on-boarding network like an open network.

Outcomes / Target Audience

Global operators Wi-Fi users will be enabled to discover a NGH network and related services, associate automatically and securely, complete provisioning with network access credentials and use the service inline with the secure network they want to use.

MAIN AREAS COVERED

• Benchmark of current NGH networks

• Gap Analysis of current NGH state

• Provisioning Standardization Use Cases

• General Requirements (User Equipment, Access Point, Controller/ WAG, AAA, NGH Roaming Database)

• Proof of Concept and Test Bed Scope

• Certificates and Policies

WBA RELATED WORK

Available for download from the Resource Centre >>

Carrier Wi-Fi Guidelines   Wi-Fi Roaming Guidelines

Quality of Service on Carrier Wi-Fi

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Quality of Service Extranet

PROJECT DESCRIPTION

Keywords
Quality of Service; Quality of Experience; Wi-Fi performance; Reporting; Metrics; Analytics

Business objectives

• Improve service experience for of customers using Wi-Fi networks
• Remove barriers to service providers to invest in Wi-Fi and NGH

Project information

Wi-Fi Standards are evolving with Carrier Grade Wi-Fi deployment steadily picking up. Evolution of existing services and proliferation of new services is causing the industry to emphasize on the quality of experience to the end user. Also, Operators would like to offer differentiated services over a Carrier Wi-Fi network with guaranteed Quality of Service (QoS). The traditional 3GPP style of imperative QoS model unfortunately does not work for WLAN Access technology due to federated deployment architecture.

Outcomes / Target Audience

Statement to the industry identifying the minimum set of requirements that operators would like to have for Wi-Fi QoS. Development of guidelines document, including standards, protocols and metrics which will be regarded as the one standard for QoS resulting in wide adoption by the industry.

MAIN AREAS COVERED

• Business Drivers
• Quality of Service Metrics
• KPI Reporting
• Service flow prioritization
• Network Monitoring
• Metrics database and reporting
• Security

QoS Metrics Service Offering
• QoS Requestor Layer
• QoS API Specification Layer
• QoS Provider Layer
• QoS Provider Service Framework Layer

WBA RELATED WORK

Available for download from the Resource Centre ≫

Quality of Service on Carrier Grade Wi-Fi

Security & Privacy over Wireless Networks

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NGH Security

PROJECT DESCRIPTION

Keywords
Security mechanisms, L2/L3 security, 802.11i, Wi-Fi Protected Access

Business objectives
• Improve customers confidence using Wi-Fi networks
• Remove barriers to service providers to invest in Wi-Fi

Project information

With the convergence of heterogeneous networks to maximize service offering and flexibility to the users, the ecosystem players need to develop, interoperate and deploy proper security for various the network technologies, device types and services required by the operators.

Moreover, privacy aspects are becoming pivotal in several regions throughout the world, a common industry approach intends to remove barriers when using Wi-Fi networks.

Outcomes / Target Audience

This project aims to write a white paper to facilitate the understanding and identify challenges that service providers and vendors need to address to bring security to various services, especially those offered over trusted and untrusted Wi-Fi networks.

MAIN AREAS COVERED

• Joint collaboration between operators and vendors to discuss policy and methods to facilitate security policy, credential provisioning, remediation, and management

• Promote collaboration between 3GPP, NGH, devices, and ISV ecosystem vendors /providers to promote strong and flexible authentication and transport security, as well as interoperability / test

• Identify policy interoperation gaps and work toward improvement proposal through liaison

• Identify guidelines and best practices on security policy and management

WBA RELATED WORK

Available for download from the Resource Centre ≫

Carrier Wi-Fi Guidelines

Convergence of Cellular and NGH networks – ANDSF/ HS2.0 Policy (Guidelines & Trial)

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Policy Whitepaper

PROJECT DESCRIPTION

Keywords
Convergence of Wi-Fi and Cellular; New Policy Mechanisms; Use Cases; ANDSF & HS2.0 Overview

Business objectives
• Open new revenue streams by using innovative technology options
• Identify the business opportunities and challenges for ANDSF

Project information

Policy is becoming a key tool for operators to manage networks and deliver the best experience possible to the customers.

This WBA efforts assess the following dimensions to make the interworking a reality:

• Access Network Discovery

• Selection Policy

• Mobility Policy

• Routing and Flow Policy

• Non-seamless Offload Policy

• Enforcement Preference and Overriding

• User subscription plan awareness

A scope document and respective test plan are used to conduct and end-to-end trial between different players in the ecosystem.

Outcomes / Target Audience

This whitepaper facilitates the understanding and identifies challenges that operators face to implement solutions for policy such as 3GPP ANDSF and WFA HS 2.0 Rel2.

MAIN AREAS COVERED

• State-of-the-art - Operator's policy

• Use cases, business models & opportunities for WBA members

• Current challenges that operators face to implement solutions for policy

• Guidelines and best practices for operators on policy

• Policy interoperation gaps & recommendations to relevant industry bodies

• Scope for trial the of ANDSF & Passpoint Release 2 solutions for policy

WBA RELATED WORK

Available for download from the Resource Centre ≫

Convergence of Cellular and Next Gen Wi-Fi Networks – ANDSF and HS2.0

Location Based Services (LBS) and Advertising

PROJECT LEADERS

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Location Based Services Extranet

PROJECT DESCRIPTION

Keywords

Location, end-user device, analytics, RSSI, MAC Address, Probe, business case, geofencing, Wi-Fi coverage

Business objectives

• Identify the business opportunities and challenges for LBS and advertising
• Foster the deployment of LBS and advertising

Project information

Indoor Location-Based Services over Wi-Fi networks have become very important for many venues globally, where Wi-Fi networks are already available. However, there are significant Wi-Fi network related concerns and issues that need to be addressed for reliable, scalable and standard-based enablements to take place and all ecosystems to benefit from. The Industry should study the possibility of standardizing the Wi-Fi based LBS analytics, to develop a harmonized mechanism to make device MAC Address and the detailed information (RSSI, Time Stamp) available to the analytics engine and servers, and enabling for value added services. User device information is available through 802.11 standard frames such as Probe request, Data messages and ACK Messages from devices and these frames are transmitted regularly

(different period depending on OS version). Some vendors and service providers have their own proprietary solutions for gathering above message frames for LBS solutions, but these solutions are not interoperable with one another. Operators and LBS service providers which have AP provided from different vendors can extend their LBS business if each solution is interoperable by standard or certificate program.

Outcomes / Target Audience

Driven by the needs of the operators, WBA, leveraging its earlier work on LBS in 2015 and new industry developments to study how to address identified issues and explore the creation of a reliable, scalable and standard based solution available to the industry.

MAIN AREAS COVERED

• Opportunities for operators and various venues for Indoor Wi-Fi based analytics, including the use cases that will support and benefit from a standardize LBS analytics. Provide a guideline for an end-to-end system enabling the Wi-Fi based analytics solution. Develop minimum set of requirements. Identify the gaps for standard based solutions. Specify the systems behavior with its components. Field trials based on this set of standards that differentiate from other efforts in the Industry.

• Leverage the previous WBA work on LBS over Wi-Fi. Identify the market opportunities and related Use Cases that justify the development of a standardization of a minimum set of requirements for AP Interfaces for LBS analytics over Wi-Fi, based on geographic outreach and criticalness

• Identify the challenges for an industry standardization or recommendation of device based LBS over Wi-Fi metrics measurement. Also, analyse industry standardization items addressing Emergency related topics

WBA RELATED WORK

Available for download from the Resource Centre >>

Location Based Services (LBS) Over Wi-Fi

END-TO-END INTEROPERABILITY, FIELDS TRIALS, AND ROAMING

Testing & Interoperability Umbrella Group

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NGH Trial Phase 4 extranet

PROJECT DESCRIPTION

Keywords
NGH, Live Testing, Wi-Fi Roaming, Passpoint, HS2.0 R1&R2, RADIUS, Online Sign-up, Operator/user policy, City Roaming

Business objectives

• Improve customer experience on NGH networks by eliminating barriers (devices and infrastructure)
• Give more confidence to service providers to invest in NGH and device vendors to develop support NGH

Project information

Next Generation Hotspot (NGH) Trials - In an effort to further bolster the expansion of NGH in the wireless ecosystem this testing effort is to build on the efforts performed in previous phases and expand the testing efforts beyond what is available in the HotSpot 2.0 (HS2.0) specifications and initial user experience. In this project the effort include testing and further validation of additional devices that declare themselves HS 2.0 compliant and not showing as certified on publicly available sources.

**Next Generation Wi-Fi Live Globalization / City Wi-Fi Roaming Trial - **These initiatives deliver fully operational Next Generation Hotspot (NGH) Wi-Fi network in grand scale in straight partnership with City authorities and other venues raising participation numbers to a scale

of tens of thousands. If you would like to propose a deployment scenario or a partnership to deliver Next Gen Wi-Fi at a specific event please contact: **nghlive@wballiance.com**

Outcomes / Target Audience

All in all, a stepping stone towards commercial deployments:

• More testing on key features for operators in order to deploy commercial networks (e.g. Online sign-up, 802.11 association)

• Open to more devices which are widely available on the market (e.g. iPhone, Google Nexus, LG Stylus/X)

• Open to operating systems for the first time (e.g. Android 7.0, Windows 10)

MAIN AREAS COVERED

• Definition of a scope document with use cases relating to practical usage of NGH networks

• Focus on roaming scenarios testing by multiple partners

• Focus on HS2.0 R1 and R2 capabilities testing in a real world environment

• Development of test plan spanning across all potential case scenarios

• Testing multiple devices currently available in the market

• Discussion forum to address NGH related topics

WBA RELATED WORK

Available for download from the Resource Centre »

Wi-Fi Roaming Standard (WBA WRIX)   Wi-Fi Roaming Business Case

Carrier Wireless Services Trial

PROJECT LEADERS

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Carrier Wireless Services Trial Extranet

PROJECT DESCRIPTION

Keywords

Live testing, WRIX, NGH authentication, Quality of Service, Policy Interworking (ANDSF & HS2.0), Wi-Fi Calling

Business objectives

• Improve customer experience using unlicensed wireless services
• Give more confidence to service providers to invest in unlicensed wireless services

Project information

WBA members acknowledge the importance of Next Generation Wi-Fi Trials heritage in WBA and how they keep helping the industry move forward. Thus, Carrier Wireless Services Trial include, as baseline, test cases to assess WRIX and NGH authentication, evolving to a new layer of services testing, including Quality of Service, Policy Interworking (ANDSF & HS2.0) and Wi-Fi Calling.

The work aims to be based on the different use cases, architectures and gaps identified within these 3 groups. A testing architecture and scenario is ought to be defined by outlining all the testing capabilities, available as of today or in the future, potentially leading to a phased in testing. All the trials and testing are aimed to be completed on live end-to-end networks.

Outcomes / Target Audience

The results of the trial will be shared with participants and the industry. The project team may produce individual test reports to be shared with participants, either directly or indirectly (if not members) suggesting the participation on CWSC to solve any identified gaps/issues.

MAIN AREAS COVERED

• Scope document listing and defining all testing possibilities based on existing technologies - summary of "targetable" objects based on a selection of the use cases developed by the 3 groups, Quality of Service, Wi-Fi Calling and Policy along with existing NGH test cases

• Develop a test plan to validate existing technologies on a collaborative effort

• Identify gaps and propose solutions such as identifying communication interfaces that must be developed in order to guarantee an effective end-to-end system management

WBA RELATED WORK

Available for download from the Resource Centre ≫

WBA Wi-Fi Calling – Opportunities and Challenges towards 5G   Carrier Wi-Fi Guidelines

WBA Roaming Standards

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PROJECT DESCRIPTION

Keywords
Wi-Fi Roaming, Carrier Wi-Fi, Accounting, Billing, Invoicing, Interconnect

Business objectives
• Accelerate Wi-Fi Roaming services by continuous improvements on WBA documentation
• Grow WBA members roaming business by providing the necessary tools to facilitate interconnections

Project information

The WBA acronym WRIX stands for **W**ireless **R**oaming **I**ntermediary e**X**change. One of the main aims of WRIX is the enhancement of the roaming experience for the customers of WBA wireless networks. The WBA WRIX Umbrella Document describes all the sub-parts of the WRIX portfolio: WRIX for Network (WRIX-n) (This Document); WRIX for Radius Interconnection (WRIX-i); WRIX for Clearing (Data and Financial) (WRIX – d/f); Location Feed Format & File Exchange Standard (WRIX-L).

Outcomes / Target Audience

This frameworks aims to help operators avoid some of the network configuration pitfalls and shorten the operator learning experience but also to standardise the approach between operators to ensure the best roaming experience for WBA wireless network users, and to promote the rapid set up of roaming agreements between WBA operators using standardised financial and technical approaches based on WRIX.

MAIN AREAS COVERED

Guidelines for Network Deployment for Operators to Create, Upgrade or Optimize Their Wi-Fi Networks to provide Wi-Fi roaming services and interoperability:

• Authentication Methods

• Connection Bandwidth Requirements

• Network Discovery and Selection Features

• NGH Network Security and management

• User Experience

• Information Exchange

• Profile Management

• Governance Model

WBA RELATED WORK

Available for download from the Resource Centre ≫

Wi-Fi Roaming Standard (WBA WRIX)

Wi-Fi Roaming Business Case

Wi-Fi Roaming Guidelines

Carrier Wireless Services Certification

PROJECT LEADERS

WBA Members

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Carrier Wireless Services (CWS)
Testing/Certification

PROJECT DESCRIPTION

Keywords

NGH, Live Testing, Wi-Fi Roaming, Passpoint, HS2.0 R1&R2, RADIUS, Online Sign-up, Operator/user policy, Quality of Service, Policy, Wi-Fi Calling

Business objectives

• For Carriers - test and validate wireless services instead of in-house testing
• For Vendors - validate carriers requirements in order to facilitate sales and save testing resources

Project information

WBA championed Next Generation Hotspot (NGH) Trials since 2011, as a one-time effort. NGH Trials outputs (use cases, test plans, testing reports) have been widely spread across the industry (including WFA and GSMA, by liaisons and schedule meetings).

Based on the NGH Trials results, improvement areas and gaps were identified, both on the:

• Usability and implementation of specifications by the device vendors

• End-to-end architectures

The certification program focuses on:

- Wi-Fi Roaming
- Wi-Fi Offload
- Quality of Service
- Wi-Fi Calling

Outcomes / Target Audience

All in all, CWS program is a new model of maintaining a permanent NGH Trial and services layer, open to all members and run by independent labs.

The industry is invited to participate (Operators and Vendors) by submitted equipment to be tested and foster live deployments.

MAIN AREAS COVERED

• Specific framework for the Wi-Fi industry to perform end-to-end testing of operators' requirements

• Sustainable model to support end to end NGH compliancy testing on an on-going basis

• Improving the end user experience of Wi-Fi in the growing marketplace with seamless connectivity, mobility and bandwidth demands

• Testing key innovative services currently on the Wi-Fi industry (roaming, offload, quality of service, Wi-Fi Calling, policy interworking)

WBA RELATED WORK

Available for download from the Resource Centre ≫

Carrier Wi-Fi Guidelines

Interoperability Compliance Program

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PROJECT DESCRIPTION

Keywords
Interoperability, Compliance Level, WRIX Standards, Wi-Fi Roaming

Business objectives
• Foster usage of best practice NGH roaming network architecture
• Give more confidence to service providers to deploy NGH Roaming services

Project information

For years, it was difficult to guarantee the correct adoption of the WBA WRIX specifications and roaming guidelines. A formal process was required to be able to impose the correct interpretation of WBA WRIX specifications and roaming guidelines.

The Interoperability Compliancy Program (ICP) – launched in 2012 - facilitates operators that globally work together on a common set of technical and commercial frameworks for Wi-Fi roaming.

Outcomes / Target Audience

Operators, the main target, have indicated the following objectives to participate and achieve ICP compliance, in order of importance:

1 Support the internal development and implementation of WRIX roaming standards

2 Support the development and implementation of WRIX with external partners

3 Support the technical integration of roaming agreements

MAIN AREAS COVERED

Guidelines for Network Deployment for Operators to Create, Upgrade or Optimize Their Wi-Fi Networks to provide Wi-Fi roaming services and interoperability:

• Create different tiers of compliance for operators that best describe the capabilities of their networks

• Facilitate the integration of roaming agreements among operators, with the guarantee that operators follow correctly the WRIX (Wireless Roaming Intermediary eXchange) specifications and roaming guidelines

• Facilitate the interoperability between operators to simplify and accelerate the implementation of Wi-Fi Roaming

• Support technical integration of Wi-Fi roaming, hence reducing the time to market, being substantially important for new WBA members

• Provide an exchange of Technical and Business Exchange documents to/from a central repository.

• Recent additions to the programme have been made to include the quality of interoperability in and between networks, network performance and throughput, and user experience

5G

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5G Extranet

PROJECT DESCRIPTION

Keywords
Next Generation Network, New Use Cases, Coexistence, Convergence

Business objectives
• Advocate and clarify the role of Wi-Fi and unlicensed wireless in 5G
• Foster a coordinated approach of 5G access networks by performing early testing

Project information

5G intends to enable a seamlessly connected society in the 2020 timeframe and beyond that brings together people along with things, data, applications, transport systems and cities in a smart networked communications environment.

Several industry bodies are currently defining and working on 5G related topics, such as ITU, ETSI, 3GPP, IEEE, NGMN among others. WBA have been working on the Carrier Wi-Fi roadmap development along with key work on bridging the cellular and Wi-Fi world together.

WBA aims to identify the user case being discussed and how Wi-Fi and other unlicensed technologies can play a key role in enabling those in a 5G framework.

Outcomes / Target Audience

In fact, 5G is one of key streams under WBA's vision 2020 and its Members are focusing on outlining the path towards convergent licensed and unlicensed world. Moreover,

WBA plans to issue in the near term the 5G <> Unlicensed wireless interfaces trialing.

MAIN AREAS COVERED

1 Summarize the definition of 5G networks and its components/ technologies/architecture, leveraging on ongoing key forums work and use cases

2 Explore how 5G will increase network capacity, offload, services enablement, policy, etc.

3 Explore how to combine licensed and unlicensed technologies on the 5G architecture to meet the broad range of IMT-2020 requirements

4 Explore how to address gaps between the different technologies (authentication, user usability, devices management, etc.)

5 Foreseen Wi-Fi evolution to cope with 5G predicted requirements and use cases - How WBA Members (Vendors & Operators) can work together to promote upcoming Wi-Fi capabilities, including standardization of interfaces

6 Future vision of mobile networks evolution to cope with 5G

WBA RELATED WORK

Available for download from the Resource Centre »

Roadmap for Coexistence and Convergence in 5G – Market Research

Unlicensed LTE

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PROJECT DESCRIPTION

Keywords
Unlicensed Spectrum, LTE-U, LAA, LWA, LWIP, Standalone access, Policy, Use Cases, End-to-end trial

Business objectives
• Validate business opportunity of uLTE technologies
• Capitalize on Wi-Fi investments to augment range of services provide to LTE providers as offload

Project information

As the technologies for LTE in unlicensed bands approach readiness for operational deployment, the use cases and real-world deployment considerations will become more clear and targeted by vendors and operators.

This, in turn, will provide more clarity about how the technology will impact the wireless market, and impact incumbent technologies (especially Wi-Fi) in nearby deployments.

The recommendation is to update the sections in previous WBA work outlining the anticipated deployment of unlicensed LTE on its LTE – Wi-Fi RAN interworking variations (.e.g LWA, LWIP, MulteFire), and discussing these impacts, in situations such as:

• LTE/Wi-Fi RAN Interworking and Carrier Wi-Fi coverage overlapping scenarios

- Indoor/Outdoor deployment
- Macro and Small Cell usage and interaction
- Integrated (into licensed nodes) or standalone unlicensed nodes

• Neutral host support

Outcomes / Target Audience

Current Unlicensed LTE work streams are evolving in the following order:

1 Market Drivers
2 Deployment Guidelines
3 Trial (LWA, LWIP, MulteFire)

MAIN AREAS COVERED

Overview of Proposals for LTE Operation in Unlicensed Spectrum (LTE-U; LAA-LTE; LWA; LWA IP; Standalone)

• System Objectives

• Deployment scenarios

• Regulatory aspects

• Coexistence topics

• General description of LTE-WLAN Aggregation and its implications

• Relation with Carrier Wi-Fi

• Anticipated Deployment Scenarios for Unlicensed Spectrum LTE Proposals

• Expected Timelines for the Various Proposals

WBA RELATED WORK

Available for download from the Resource Centre >>

Unlicensed Spectrum LTE – Market Drivers and Roadmap

Multi-x or Multi Connectivity Trial

PROJECT LEADERS	FOR MORE INFORMATION
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PROJECT DESCRIPTION

Keywords

Quality of Experience (QoE), Multi-network, Abstraction Layer, Coupling, Interworking, Aggregation of Capabilities

Business objectives

• Explore a new business opportunity for WBA members to leverage
• Create the test bed for the technology to become a reality

Project information

The amount of traffic carried over wireless networks has grown tremendously and is multiplying exponentially year-on-year. It has become a huge challenge to mobile operators to provide a high QoE to their subscribers amidst the limited spectrum resources available.

In this direction, there is a very strong need for a technology concept which allows a very easy and highly effective way to realize multi-network interworking with least coupling between the networks. Such a concept has to allow operators to seamlessly extend the solution when future technologies like 5G and MulteFire see commercial deployments and not limit to existing technologies alone.

When interworking different networks, one has to cater to various cases like trusted and untrusted deployments, ensure operator policies in place are not impacted (e.g. HS2.0, ANDSF), cater to cases where there are no direct operator agreements in place but still a need to leverage coverage and capacity is desired, ensure security of individual networks, support lossless switching across different accesses, support aggregation of capacities across multiple accesses, support possibly different charging for re-directed traffic. These are some of the immediate needs that will need to be harmonized to ensure that the solution works without impacting existing operators' network.

Outcomes / Target Audience

Industry will further identify the different use cases to be addressed and trialed to ensure the goals are met regarding capacity, coverage, performance, QoE.

MAIN AREAS COVERED

• Develop a scope document listing and defining all deployment possibilities based on existing technologies - Create a summary of most important deployments to be addressed first, the inherent challenges faced today for those deployments, Multi-X solution to the problem, effectiveness of Multi-X in comparison to other ways to achieve such interworking where applicable, keys functionality desired for such deployments like lossless switching, packet level aggregation, existing with MPTCP, etc..

• Develop a test plan to validate shortlisted deployments on a collaborative effort

• Identify gaps and propose solutions such as identifying tunneling mechanisms, ensuring security, achieving on par or higher performance compared to traditional methods, co-existence with other solutions in a HetNet deployment.

Internet of Things Streams

PROJECT LEADERS	FOR MORE INFORMATION
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PROJECT DESCRIPTION

Keywords

Unlicensed Access for IoT, New Value Chains, IoT Identities, Roaming, Verticals Interoperability

Business objectives

• Identify business requirements for IoT roaming and interoperability
• Improve the identity management for IoT and open up a new business driver for WBA

Project information

The diverse range of IoT vertical segments can easily dilute focus. Hence, WBA members are engaging to set priorities on a specific set of IoT use cases which are paving the way.

Acknowledging value is migrating towards the IoT application, focus is on evolution of core WBA competencies associated with network connectivity, identity and service management. WBA is conducting analysis on the evolution of existing value chains and the future role of evolved Passpoint/NGH based roaming to accelerate the deployment of those services (unlicensed technologies, monetization/revenue, roaming capabilities).

Outcomes / Target Audience

All in all, WBA is focusing on delivering a new perspective to the IoT space facilitating the definition of identities which in the near term will result in broad interoperability and roaming capabilities.

MAIN AREAS COVERED

Definition of vertical markets and respective un-licensed access technologies

• Enablement platforms, capabilities and IoT identities which impact WBA Members

• Interoperability between technologies (IoT verticals)

• Analysis of the evolution of existing value chains

• IoT Identities and Roaming

• Evolution of Passpoint/NGH based roaming to accelerate the deployment of IoT services

WBA RELATED WORK

Available for download from the Resource Centre >>

IoT New Vertical Value Chains and Interoperability

CONNECTED CITIES & INTERNET OF THINGS

Connected City Blueprint

PROJECT LEADERS	FOR MORE INFORMATION
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PROJECT DESCRIPTION

Keywords
Unlicensed Access for IoT, New Value Chains, IoT Identities, Roaming, Verticals Interoperability

Business objectives
• Identify the business opportunities and challenges for a connected City
• Practical templates and requirements to facilitate connectivity management

Project information

Under the umbrella of the Connected City Advisory Board (CCAB) and the Wireless Broadband Alliance (WBA), the Connected City Blueprint is intended to work as a guideline to support cities and government authorities to develop their connected city plans, and for the broader wireless industry, including citizens, entrepreneurs, operators, regulators, equipment manufacturers and service developers to better understand the challenges and opportunities of the Connected City and Smart City ecosystem.

• Overall connectivity is important to a city on many layers;

• Citizens: Providing greater convenience and better quality of life;

• Businesses: Create new economic opportunities for companies in all sectors including tech, media, healthcare, logistics and many more;

• Government: Efficiently manage and run the city by anticipating needs and providing improved services to its people.

Outcomes / Target Audience

The Connected City Blueprint report is a starting point to aggregate and identify Cities and Local Authorities views and perspectives on how to structure connectivity plans, their benefits and the value propositions around a horizon that various stakeholders can understand.

MAIN AREAS COVERED

• Smart City Definition
  (The importance of the Smart City and its Challenges)

• Connected City Ecosystem and Stakeholders

• Connected City Value Proposition

• Assessing the role of different technologies
  (Technology Landscape, Wireless Broadband Technologies, IoT and Smart Cities Technologies)

• Connected City architectures & framework
  (Modelling City Services, Overview over Standardization) efforts

• Interoperability and Roaming

• Public-Private Partnerships Business models

• Big Data: Challenges, opportunities and benefits for Cities

WBA RELATED WORK

Available for download from the Resource Centre >>

Connected City Blueprint

Policy Workgroup

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Policy Workgroup Extranet

PROJECT DESCRIPTION

Keywords
Policy, Spectrum, Public Consultations, Advocay

Business objectives
• Validate business opportunity of Coordinated Shared Spectrum technologies

Project information

WBA's Policy & Regulatory Affairs Office, tracking relevant policy issues of concern to the Board and membership.

For any member interested in responding to public consultations and leveraging WBA's global reach around a specific key topic, this group is the most effective industry platform to achieve it.

Outcomes / Target Audience

The end goal is to influence positions on public policy issues. The main outcomes of the group are guidelines, white papers, respond to regulators and authorities, among others.

MAIN AREAS COVERED

• Spectrum (3.5 GHz, 5GHz, mmWave, etc.)

• Worldwide bands allocation

• Public consultations consensus and responses

WBA RELATED WORK

Available for download from the Resource Centre »

Coordinated Shared Spectrum

Coordinated Shared Spectrum

PROJECT LEADERS

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CSS extranet

PROJECT DESCRIPTION

Keywords
Licensed and unlicensed environments; Conceptual frameworks; Business models; Trials

Business objectives
• Validate business opportunity of Coordinated Shared Spectrum technologies

Project information

Policymakers and regulators are moving to introduce new models for spectrum management that would provide coordinated use of shared spectrum. The key objective of these programs is to provide conditional access to portions of spectrum with varying levels of priority based upon status (e.g. incumbents, priority users, general users).

Due to this flexible approach to spectrum access, these new programs do not align neatly with existing standards bodies and industry organizations, which are primarily focused on either fully licensed or unlicensed spectrum (e.g. 3GPP, IEEE, GSMA, WFA). The WBA is well positioned to do early stage analyses of these programs as an organization with membership spanning both the licensed and unlicensed environments.

Outcomes / Target Audience

This program is evaluating both the business models that will be supported by Coordinated Shared Spectrum management regimes and subsequent pre-commercial trials.

MAIN AREAS COVERED

• History and background of CSS

• Goals of CSS Regimes

• Conceptual frameworks for CSS (ASA, LSA, CBRS)

• Business models CSS will support

• Contrasting CSS solutions with existing Small Cell solutions

• Drivers for in-building coverage

• Characteristics relative to: Spectrum requirements; Neutral Host support; Solution Cost

• Field trials leading to commercial deployments

WBA RELATED WORK

Available for download from the Resource Centre »

Coordinated Shared Spectrum

Board Members

General and Group Members

AlwaysOn • BAI • Bell Mobility • BIGLOBE • BSkyB • BSNL • Charter Communications • China Telecom
China Unicom • Cox Communications • CTM • Deutsche Telekom • Enforta • Fon • Linktel Corporate • MCI
Meteor Network • HKT • RJIL • Rogers • Shaw Cablesystems • SingTel • SK Telecom • Smart Communications
Softbank • Spark New Zealand • StarHub • Swisscom • TalkTalk Communications • TATA • Telecom Personal
Telekom Indonesia • Telstra • TELUS • T-Mobile USA • True Corporation
TTNET • VAST • ViaSat • Wire & Wireless

Accuris Networks • Affirmed Networks • Antlabs • Aruba Networks • Broadcom • BSG Wireless
CableLabs • C-DOT • DEKRA • Edge Communications • Ericsson • Facebook • GlobalReach • Google
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Openet • Panasonic • Point Dume • Qualcomm • Ruckus • Semtech • Smith Micro • Spirent • Syniverse
Thales • UL • ZTE

Docomo Pacific • Kyrio • NTT Broadband Platform • Tata Communications • Sprint

*Membership as of July 2017

FOR MORE INFORMATION

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