

Spectrum Sharing Multi-stakeholder Committee Update for FCC

17 September 2015

Slide #1



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Participation to Date – 142 People, 40+ Organizations

Members

- Alcatel-Lucent Bell Labs*
- Astrapi
- AT&T*
- Communications Research Centre, Canada
- Ericsson
- Fairspectrum
- Federated Wireless*
- Google*
- Harris Corporation
- Huawei*
- Idaho National Labs
- Intel
- ITS (NTIA)
- Keybridge Global*
- MITRE
- Motorola Solutions*
- NASA
- Nokia Networks*
- Pathfinder Wireless*
- Rockwell Collins
- Ruckus Wireless
- Qualcomm*
- SIA
- Spectrum Bridge
- T-Mobile*
- Verizon*
- Virginia Tech
- Vistology
- WISPA
- ZTE USA

Observers

- IEEE DySPAN-SC
- DMI for US DoD
- Kingfisher Systems for US DoD
- Roberson and Associates for US DoD
- US Army/CIO
- US DISA DSO
- US DoD/CIO
- US Navy
- US NIST
- US NSWC
- US NTIA
- Utilities Telecom Council
- WiMAX Forum

** Denotes Steering Group Member*



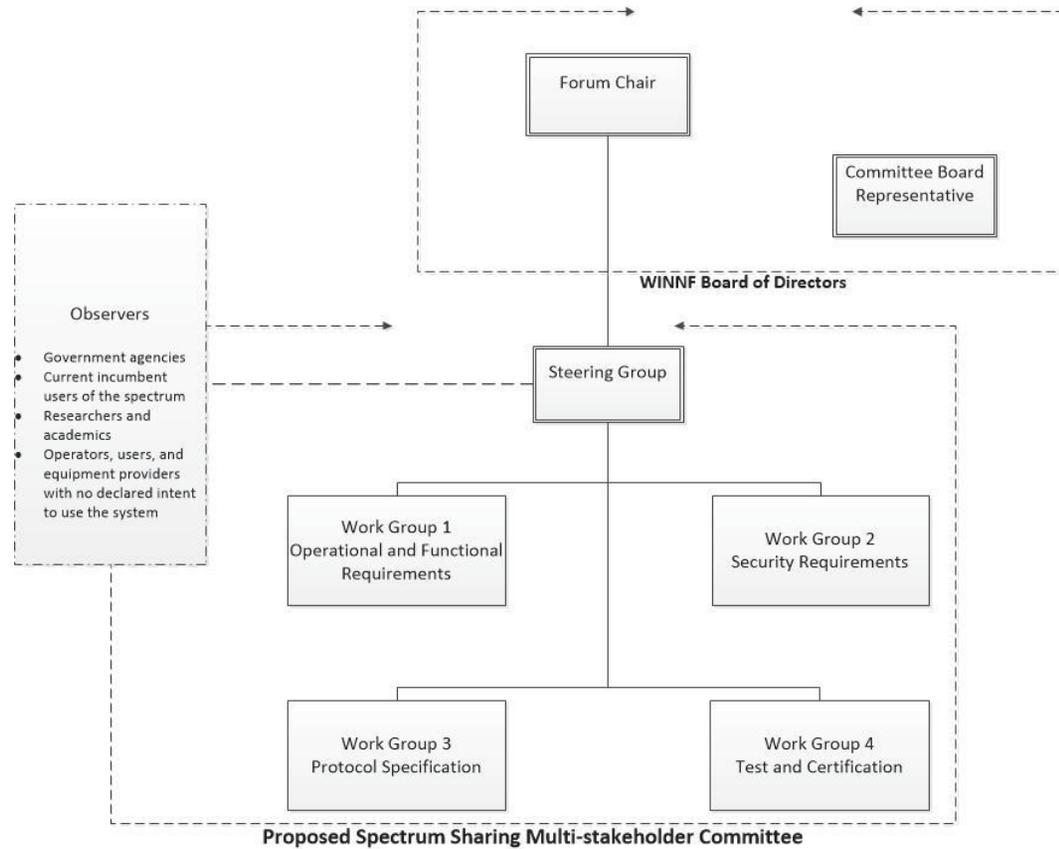
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Committee Structure



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Multi-stakeholder Group Callouts in FCC R&O

Paragraph	Call Out	Work Group
59	We acknowledge that SAS Administrators, potential licensees, and other industry stakeholders will need to develop various implementation details to facilitate development of the Citizens Broadband Radio Service. As described elsewhere in this Report and Order, we believe that many of these issues can be addressed during the SAS Approval Process and through the efforts of a multistakeholder group.	WG1
195	We recognize that ensuring compliance with this limit at the boundary is likely challenging on a real-time basis and there are legitimate questions relative to how to develop appropriate predictive models. We also recognize that the use of an aggregate metric could be challenging in a multi-user environment. ⁴⁴⁹ We encourage any multi-stakeholder group formed to address technical issues raised by this proceeding to consider how this limit should be applied.	WG1
214	For example, it might be possible that instead of the bright-line urban/rural distinction implemented in these initial rules, industry stakeholders (perhaps working through a multi-stakeholder forum) could agree on a “congestion metric” and associated methodology for SASs to reduce CBSD power levels in high-demand areas. We intend to continue an informal dialog with stakeholders on this topic and welcome the submission of additional technical analysis or reports of technological developments that can inform us going forward.	WG1
222	Given the importance of accurate reporting by professional installers, we strongly encourage the SAS and user community, through multi-stakeholder fora or industry associations, to develop programs for accrediting professional installers who receive training in the relevant Part 96 rules and associated technical best practices.	WG4 in partnership with another organization TBD
234	We encourage multi-stakeholder groups to consider the issues raised by the registration rules described in this section, including acceptable contact intervals between CBSDs and SASs, and to suggest appropriate operational parameters.	WG1
237	We encourage industry to develop detailed metrics regarding issues like received signal strength, packet error rate, and technology specific parameters of signal and interference metrics. These metrics could be developed by an industry multistakeholder group. Such guidance could be incorporated in the SAS Approval process described in section IIIH)(3)(b) or incorporated independently by authorized SAS Administrators, subject to Commission review.	WG3
240	We encourage the industry to develop best practices for end-to-end security that can be validated in the equipment and SAS certification processes.	WG2
268	We also require SAS Administrators to implement protocols to respond to directions from the President of the United States or another designated federal entity to manually discontinue operations of its associated CBSDs in a given area pursuant to 47 U.S.C. § 606. SAS Administrators must also implement protocols to manually discontinue operations of their associated CBSDs in response to enforcement actions taken by the Commission.	WG3

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Multi-stakeholder Group Callouts in FCC R&O (cont.)

Paragraph	Call Out	Work Group
289	We agree with Federated Wireless, Google, Motorola Solutions, SIA, the Wireless Innovation Forum, and others, that a multi-stakeholder process could provide insight into the technical factors and interference limits between coexisting services in the 3.5 GHz Band.	WG1
319	We continue to believe that a “light touch” regulatory approach is appropriate for this band and that the rules should include only the high-level requirements necessary to ensure the effective development and operation of fully functional SASs. We agree with commenters that support collaborative, industry-wide efforts to create standards and best practices governing SAS operations. The Commission will assist these efforts through the SAS Administrator approval process, as set forth in III(H)(3)(b). We also believe that an active multi-stakeholder group could help develop industry consensus around the best methods of meeting the SAS requirements.	All
346	We require potential SAS Administrators to develop and demonstrate that their systems include robust communications and information security features during the SAS Approval process. 745 CBSDs shall demonstrate compliant security features during the equipment authorization process. These security protocols will be subject to the Commission’s review and approval, with input from NTIA and DoD. We anticipate that given the immense value of industry-wide interoperability, groups – such as the types of multi-stakeholder groups discussed in section III(K) – will develop security models that SAS Administrators may consider, subject to Commission review.	WG2
438	We seek comment on what propagation model(s) are best suited for SAS-based protections of FSS. We solicit measurement results that validate model parameters for combined short range and long range propagation scenarios, involving indoor and outdoor propagation channels. What model(s) are the most accurate in accounting for urban clutter and other environmental factors such as rain attenuation, ducting, etc., and most suitable for modeling statistical variations to support analysis – including possible Monte-Carlo analysis – of many potential interfering sources? In order to generate the same exclusion distances between CBSDs and any individual FSS earth stations in 3650-3700 MHz, we expect each SAS to enforce the same minimum separation distance and we tentatively conclude that each SAS must use the same propagation model. We seek comment and objective analysis from anyone who believes otherwise.	WG1
440	We also invite comment as to whether we can establish a default earth station protection area based on an assumed minimum earth station receiving system gain-to-temperature ratio (G/T) and minimum antenna elevation angle, and what the assumed values of the G/T and elevation angle should be. CBSD operation outside of such a default protection area would be assumed not to cause interference to earth stations receiving in the 3700-4200 MHz band. Such a default protection area would be adjusted by the SAS to accommodate the actual operating characteristics of earth stations that are registered in order to achieve additional protection.	WG1

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Deliverables

WG1 (Operational and Function Requirements, Chairs: Andy Clegg, Google and Al Jette, Nokia Networks)

- 41 “Scenarios” Identified
- Requirements for Commercial Operation in the U.S. 3550-3700 MHz CBRS Band: February 2016

WG2 (Security Requirements, Chair: Charles Clancy, Federated Wireless)

- Operational Security Requirements: February 2016
- Communication Security Requirements: February 2016

WG3 (Protocols, Chair Jesse Caulfield, Keybridge Global)

- Interim Technical Report balloted in August, in comment resolution
- SAS to CBSD Protocol (Chair: Prakash Moorut, Nokia Networks): February 2016
- SAS to SAS Protocol (Chair: James Ni, Federated Wireless): March 2016

WG4 (Test and Certification, Chair: Kurt Shaubach, Federated Wireless)

- High level certification flow balloted in August, in comment resolution
- Test and Certification Objectives: February 2016
- Test and Certification Requirements Specification: May 2016

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Other activities

WG1/WG3 Joint Architecture Task Group

- Complete

FSS Joint Task Group

- Complete

WG1/WG2 Joint ESC Task Group

- Initiated this week

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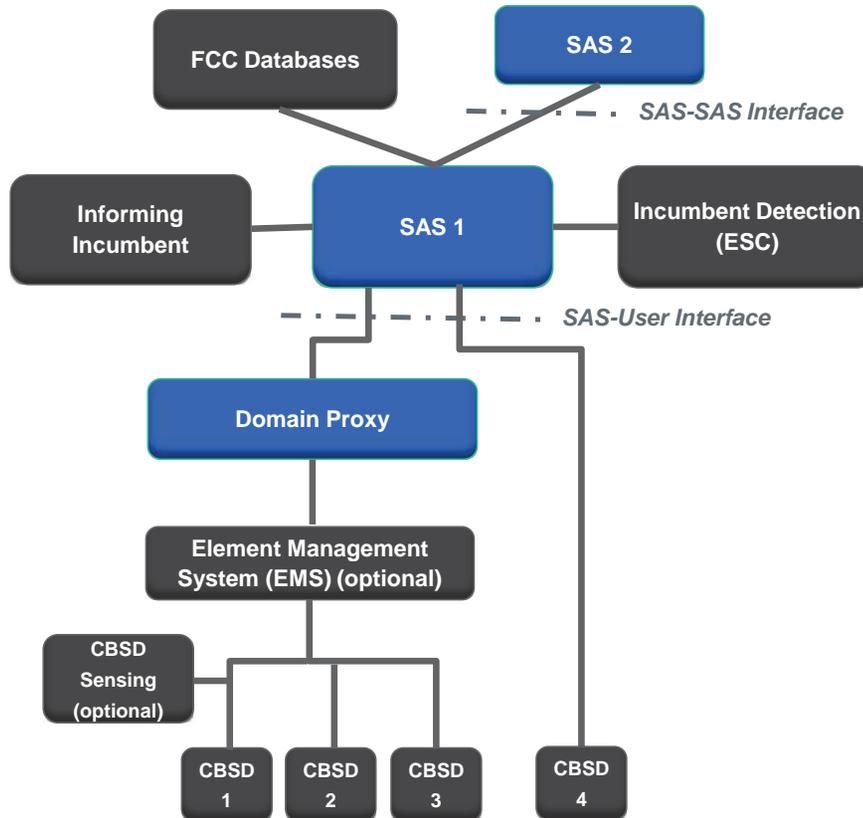


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SAS – Functional Architecture (Approved)



Acronyms:

ESC: Environmental Sensing Capability
 CBSD: Citizens Broadband Radio Service Device
 SAS: Spectrum Access System

Notes:

- A SAS may not need to support all interfaces.
- Each CBSD domain may optionally include some sensing capability (including possibly an ESC).

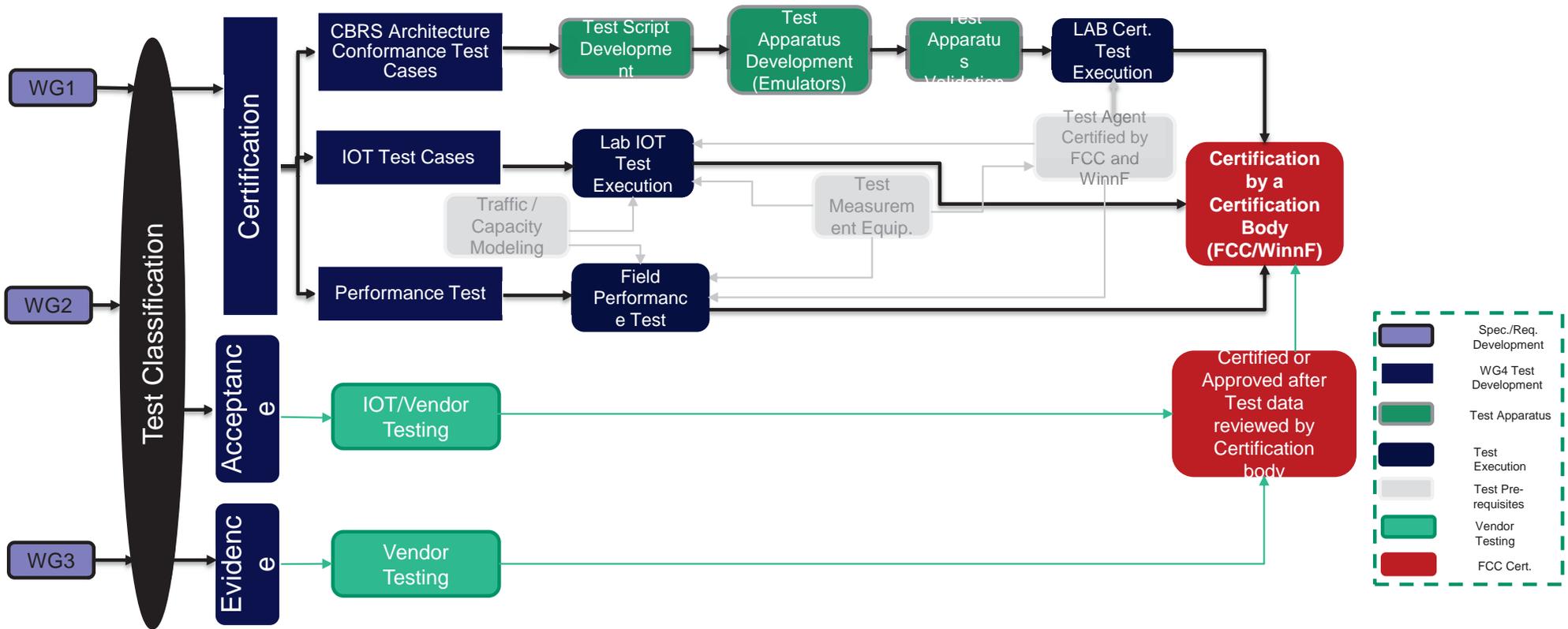
Domain Proxy Functionality

A Domain Proxy is a managing intermediary.

A Domain Proxy's function is to:

- Accept a set of one or more available channels and select channels for use by specific CBSDs, or alternatively pass the available channels to the carrier EMS for CBSD channel selection
 - EMS may optionally be co-located with the domain proxy
- Back report selected channels to SAS optionally received via EMS
- Receives confirmation of channel assignment from SAS
- Performs bidirectional bulk CBSD registration and directive processing, optionally through carrier EMS if present.
- Perform bidirectional information processing and routing.
 - E.g. interference reporting, etc.

WINN Forum Certification Flow (in ballot)



Other Notes

We (the WInnForum SSC) are developing, a set of criteria/standards for establishing a Part 96 professional installer certification program, credentials of which would be accepted by all SAS operators who are members of the Forum

We are also working on standards for certificate authorities to issue credentials identifying entities in the Part 96 ecosystem



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Meetings

Work groups meet on alternating schedule every two week

Face to face meetings approximately every 6 weeks

- 27 January
- 30 April
- 25 June
- 6 Aug
- 16/17 Sept

Webinar presented 17 June

- <https://www.youtube.com/watch?v=IQ2a4ZRjGgE>

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New questions

Technical Issues

- Will the FCC create a unique call sign for each CBSD
- Will there be an automated interface for SAS access to equipment authorization information (like TVWS)
- Have you figured out the boundary issues?

Timeline Questions

- Timeline for the PAL auction
- What is their thinking about the various items in the reconsideration
- What is the timeline for a second R&O, etc.
- Timeline for the grandfathered 3650 PN