Annual Meeting
Software Defined Radio Forum, Inc

Advanced Technologies Committee
(Formerly the Spectrum Innovation Committee) Report
8 December 2016
• What was accomplished in FY2015 (1 July 2015 to 30 Jun 2016)
  • Report:

• Recommendations:
  • Response to OFCOM Call for Information on 3.8-4.2 GHz WINNF-16-R-0058-V0.6.0
ATC Activities (FY2017)

• Planned for FY2017 (1 July 2016 to 30 June 2017)

  • Receiver Performance Technology Working Document WINNF-16-P-0020 Version V0.6.0 9 September 2016

  • Electromagnetic Spectrum Sensing Study Group

• Update:
  • Top 10 Most Wanted Wireless Innovations
  • Advocacy Agenda
LightSquared followed all of the rules…

Without GPS receiver spec, market did not design to allow spectrum reuse

Because of GPS receiver interference issues, the FCC rescinded authorization

$2.7 B Investment lost

Receiver Minimum Performance Guidelines will be a necessary part of spectrum sharing solutions
This report is being developed for regulators, designers, manufacturers and users of wireless communications systems who are developing wireless policy and equipment to access shared spectrum or to coexist with adjacent spectrum uses while understanding impact to current spectrum users.

The report will produce a set of actionable guidelines to design and evaluate the performance of receivers that will coexist in shared & adjacent spectrum bands that can be used as a foundation for future radio systems.
This report is being created for any party wishing to develop, deploy and operate a remote spectrum sensing capability who require a standardized set of methods, practices, data formats and protocols to configure, control and receive data from one or more remote spectrum sensor devices.

The “Use Cases”, “Implementation Guidelines” and, if applicable, “Data Format and Protocol” documents are publicly available resources will describe industry best practices and provide implementation resources plus guidelines to achieve technical interoperability between sensor systems and various middleware based on open standards.
Top 10 Most Wanted Wireless Innovations

Innovation #1: (modified) Techniques for Efficient Porting of Waveform Applications Between Embedded Heterogeneous Platforms

Innovation #2 (new) Network Management of Mobile Ad-hoc Radios

Innovation #3: (modified) Receiver Performance Interference Thresholds

Innovation #4: Low Cost Wide Spectral Range RF Front-End (Multi-octave Contiguous) (Tx,Rx)

Innovation #5: Efficient Techniques to Minimize Power Amplifier Spectral Regrowth in Non-contiguous Spectral Environment

Innovation #6: Increase Communications Time on Battery Charge by an Order of Magnitude

Innovation #7: Context Aware Cognitive Radio

Innovation #8: Interference Mitigation Techniques

Innovation #9: Standardized Computer Interpretable Policy Language for Cognitive Radio

Innovation #10: Flexible Regulatory Framework for Temporary, Cooperative and Opportunistic Access
CC SCA Report
8 December 2016
CC SCA Mandate

To support the harmonization of the SCA standards at the international level for the mutual benefits of all stakeholders to include:

- Defining an industry driven SCA evolution roadmap for the international community
- Developing extensions to the SCA standards that address any gaps between the defined SCA evolution roadmap and Forum accepted SCA specification variants
- Profiling the SCA specification and related APIs to define internationally accepted variants that are hosted by the Forum
- Providing implementation and certification guides, tools etc. easing implementation and supporting proliferation
- Establishing and managing industry led certification programs where appropriate
CC SCA Structure

Structure for Coordinating Committee on International SCA Standards

15 Jun 2015

Coordinating Committee on International SCA Standards (CC SCA)

Forum Officers and Board of Directors

CC SCA Steering Group, Executive Board

Advisors

SCA Implementers Work Group

International Security Services Work Group

SCA API Work Group

International Tactical Radio Special Interest Group

SCA Test and Evaluation Work Group

Transceiver Work Group

SCA Evolution Work Group

Advocacy Work Group
The CC SCA is led by a Steering group of worldwide tactical radio manufacturers.
Grouping together the Steering Group and CC SCA Advisors

- Answering to the essential need for a venue for manufacturers and customers to interact
- Advisors provide direction and feedback on CC SCA activities
- Met at least twice a year since creation (~2011)

Who are Advisors?

- Individuals related to MoDs active in the area of International SDR Standards
- Current list of Advisors covers JTNC, OCCAR-EA, FR, Ge, IT, SW, NOR MoD, FL, EDA, NATO
- Appointed upon invitation issued by the Steering Group
Standards serving SDR in the general sense

- Stemming from the SCA
- Developed by
  - Partner entities (e.g. JTNC Standards)
  - WInnF

SCA 2.2.2 and 4.1

WInnF-developed Standards: Transceiver API, IRSS, (U)Lw AEPs, PIM IDL Profiles

Policy setting efforts underway

- Web-based Issues collection mechanism, open to all
- Architecture Board operation in installation
FY2016 Accomplishments

REPORTS
WINNF-16-P-0025.V0.6.0 (IR1) SCA 4.1 Compliancy Interim Release 1

SPECIFICATIONS
WINNF-14-S-0016-V2.0.1 IDL Profiles for Platform Independent Modeling of SDR Applications

RECOMMENDATIONS
WINNF-16-R-0085-V1.0.0 Endorsement of SCA 4.1
WINNF-16-R-0066-V1.0.0 Comments on SCA 4.1 Candidate
Started early 2016 aiming for completion end 2016

Chaired by JTNC Standards

Project to deliver WInnF specification capturing compliancy criteria for all SCA 4.1 requirements

Interim deliveries already available (on partial scope)
  • Release expected early 2017
Started early 2015

Project now to deliver
  • PIM standard by end 2016
  • PSM standards (C, SCA, VHDL, …) to follow closely

Delayed for best reason: active participation
  • Cobham, DGA, Harris, FKIE, HKE, JTNC Standards, NordiaSoft, Rockwell-Collins, Rohde & Schwarz, Thales
  • TEMs so far: Paris, Ottawa, Wichita, Erlangen, Rennes, Ottawa, Paris
  • Weekly 2h teleconferences

Follow-up projects to aim at
  • Domain-oriented profiles for portability improvement
  • Capabilities extensions
Started early 2016 aiming for completion end 2016

Project to deliver exploratory report identifying technology / standards gaps for coalition contexts

Contributions and involvement from government stakeholders remain welcome (NATO countries and beyond)
Spectrum Sharing Committee: Scope

- Serve as a common industry and government standards body to support the development and advancement of spectrum sharing technologies.
- Initial focus on 3.55 GHz, with aims to advance this technology for all applicable spectrum bands that can benefit from it.
- This Committee is intended to facilitate the interpretation and implementation of FCC rulemaking to a level that allows industry and government parties to collaborate on implementation of a common efficient, well functioning ecosystem around this technology.
The main activities that will conducted in the Committee include:

- Detailing common industry and government functionality and architecture for Spectrum Access Systems (SAS), sensors, and devices
- Interoperability requirements and protocol definition to allow for open competitive and well functioning systems
- Common framework for testing and integration of components of spectrum sharing technologies to allow for rapid certification and deployment and predictability, thus expanding the ecosystem and increasing utility of the spectrum
- Details of requirements, processes, and methods for protection of incumbent users as required by the spectrum rules
- Operational procedures definition for the well functioning of the system as it pertains to spectrum assignment, managements and interoperability
## Participation to Date – 200+ People, 50+ Organizations

### Members
- Airspan Networks
- Amdocs
- Astrapi
- AT&T*
- Cable Labs
- CTIA*
- Communications Research Centre, Canada
- ComSearch*
- Ericsson*
- Federated Wireless*
- Google*
- Harris Corporation
- Huawei*
- Idaho National Labs
- Intel
- ITS (NTIA)
- Key Bridge Global*
- LGS Innovations
- LS Telcom
- MITRE
- Motorola Solutions*
- NASA
- Nokia Networks*
- Pathfinder Wireless*
- Qualcomm*
- RED Technologies
- Rockwell Collins
- Ruckus Wireless
- Senslinq
- SIA
- Sony*
- Spectrum Bridge
- Tarana Wireless
- T-Mobile*
- Verizon*
- Virginia Tech
- Vistology
- WISPA
- ZTE USA

### Observers
- IEEE DySPAN-SC
- DMI for US DoD
- Kingfisher Systems for US DoD
- New America Foundation
- NAB
- 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
Committee Structure

Observers
- Government agencies that are engaged in the development of this system (i.e. FCC, NTIA, NIST)
- Current incumbent users of the spectrum
- Researchers and academics with special knowledge and contribution
- Operators, users, and equipment providers with no declared intent to use the system but with interest in the topic

WINNF Board of Directors

Forum Chair

Committee Board Representative

Steering Group

Work Group 1 Operational and Functional Requirements

Work Group 2 Security Requirements

Work Group 3 Protocol Specification

Work Group 4 Test and Certification

Work Group 5 Operations

Spectrum Sharing Multi-stakeholder Committee

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FY2016 Approved Documents

REPORTS
WINNF-15-P-0051-V1.0.0 Interim SAS to SAS Protocol Technical Report-A
WINNF-15-P-0023-V1.0.0 Interim SAS to CBSD Protocol Technical Report-A
WINNF-15-P-0060-V1.0.0 SSC WG4 Certification Process
WINNF-15-P-0047-V1.0.0 SAS Functional Architecture
WINNF-15-P-0062-V1.0.0 Interim SAS to CBSD Protocol Technical Report B
WINNF-16-P-0063-V1.0.0 Interim SAS to SAS Protocol Technical Report B
WINNF-16-P-0089-V1.0.0 CBRS Threat Model

SPECIFICATIONS
WINNF-15-S-0112-V1.0.0 CBRS Operational and Functional Requirements
WINNF-15-S-0071 CBRS Operational Security

RECOMMENDATIONS
WINNF-15-R-0200-V1.0.0 WiInnForum Comments on 3650 Protection Contours
WINNF-15-R-0092-V1.0.0 Emission Measurement Ex Parte
WINNF-15-R-0058/0059-V1.0.0 Reply Comments on the Second FNPRM
WINNF-15-R-0045-V1.0.0 WiInnForum Comments on the Report and Order
Release 1 Publication Timeline

Operational and Functional Requirements - V1.0.0
Jan 27 '15 - May 13 '16

Operational and Functional Requirements - V2.0.0
Mar 31 '16 - Nov 30 '16

Cybersecurity Requirements (COMSEC) - V1.0.0
Jan 27 '15 - Aug 2 '16

Operational Security Requirements (OPSEC) - V1.0.0
Jan 27 '15 - Jun 21 '16

SAS to CBSD Protocol Specification - V1.0.0
Feb 19 '16 - Dec 16 '16

SAS Testing and Certification Requirements Specifications - V1.0.0
Jul 24 '15 - Dec 2 '16

SAS/CBSD Testing and Certification Requirements Specifications - V1.0.0
Jul 24 '15 - Feb 1 '17
Certified Professional Installer Model
Apr 13 '16 - Sep 6 '16

Operational and Functional Requirements - V3.0.0
Jul 12 '16 - Mar 22 '17

SAS to SAS Protocol Specification - V2.0.0
Nov 3 '16 - May 2 '17

SAS to CBSD Protocol Specification - V2.0.0
Dec 8 '16 - Jun 7 '17

Testing and Certification Specifications - V2.0.0
Feb 6 '17 - Jul 28 '17
Annual Meeting
Software Defined Radio Forum, Inc

Operations Report
8 December 2016
Total Membership (As of 30 October Each Year)
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FY2016 Meetings and Events

General
- WInnComm Europe 2015: 6 to 8 October
- WInnComm 2016: 15 to 17 March

CCSCA Events
- Hosted Webinars
  - JTNC SCA 2.2.2 to SCA 4.1 Migration Briefing – 30 Sep 2016
- Transceiver Next Meetings
  - Jul 2015
  - Sep 2015
  - Jan 2016

India Regional Committee Meetings
- July 2015
- Jun 2016

Spectrum Sharing Committee Events
- Webinars
  - SSC SAS to CBSD and SAS to SAS Early Release Protocols - Jun 2016
- Committee Meetings
  - Aug 2015
  - Sep 2015
  - Nov 2015
  - Jan 2016
  - Feb 2016
  - Mar 2016
  - May 2016
  - June 2016
Thank You to Our Sponsors

- Google
- Leonardo
- Motorola Solutions
- Thales
Supporting Collaborative Development of Reports, Recommendations and Specifications

Professional Tools

- Group Portal
- Document Development
- File Management
- Tele/Web Conferencing
- Go To Meeting

Staff Support

- Technical Editing
- Graphic Design
- Configuration Management
- Balloting
Memberships and Partnerships

Wireless Innovation Forum Memberships and Partnerships

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### Website Page Views

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28 Press Releases published thus far in CY2016

Topics include:

- Project initiation
- Formation of new groups
- Approval and publication of reports, recommendations and specifications

http://www.wirelessinnovation.org/forum-news
Dozens of discounts negotiated for Forum Members

- Market Studies
- Events
- Products and Services

See Website for Details
RSS news feed:
• http://feeds.feedburner.com/SDRForumNews

Twitter
• http://twitter.com/winnforum

Linked In:
• http://www.linkedin.com/groups?mostPopular=&gid=95572

Facebook:
• http://www.facebook.com/WInnForum?ref=sgm

Tumblr
• http://winnforum.tumblr.com/

Wikipedia
Annual Meeting
Software Defined Radio Forum, Inc

Finance Committee Report
8 December 2016
### Balance Sheet

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<td>Cash and cash equivalents</td>
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<td>Total Current Assets</td>
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| LIABILITIES AND NET ASSETS  |          |          |
| **CURRENT LIABILITIES**     |          |          |
| Credit card payable         | $4,137   | $6,305   |
| Total Current Liabilities   | $4,137   | $6,305   |
| **NET ASSETS:**             |          |          |
| Unrestricted net assets     | $286,376 | $239,935 |
| Total Net Assets            | $286,376 | $239,935 |
| Total Liabilities and Net Assets | $290,513 | $246,240 |