

Introduction to the Wireless Innovation Forum (SDR Forum Version 2.0)

26 November 2016

What is the Wireless Innovation Forum

A nonprofit “mutual benefit corporation” dedicated to:

“advancing technologies supporting the innovative utilization of spectrum and the development of wireless communications systems, including essential or critical communications systems”



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Corporate Background

Incorporated in California as a Non-profit Mutual Benefit Organization

Registered with the US Government as a Standards Development organization under the National Cooperative Research and Production Act of 1993, as amended by the Standards Development Advancement Act of 2004

DEPARTMENT OF JUSTICE

Antitrust Division

Notice Pursuant to the National Cooperative Research and Production Act of 1993—The Software Defined Radio Form

Notice is hereby given that, on September 20, 2004, pursuant to section 6(a) of the National Cooperative Research and Production Act of 1993, 15 U.S.C. 4301 *et seq.* (“the Act”), The Software Defined Radio Forum (“SDR Forum” has filed written notifications simultaneously with the Attorney General and the Federal Trade Commission disclosing (1) the name and principal place of business of the standards development organization and (2) the nature and scope of its standards development activities. The notifications were filed for the purpose of invoking the Act’s provisions limiting the recovery of antitrust plaintiffs to actual damages under specified circumstances.

Pursuant to section 6(b) of the Act, the name and principal place of business of the standards development organization is: The Software Defined Radio Forum,



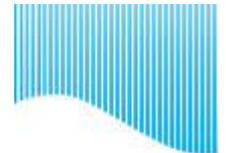
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Driving the future of radio communications and systems worldwide

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The Forum Is Its Members



And many more...

Driving the future of radio communications and systems worldwide

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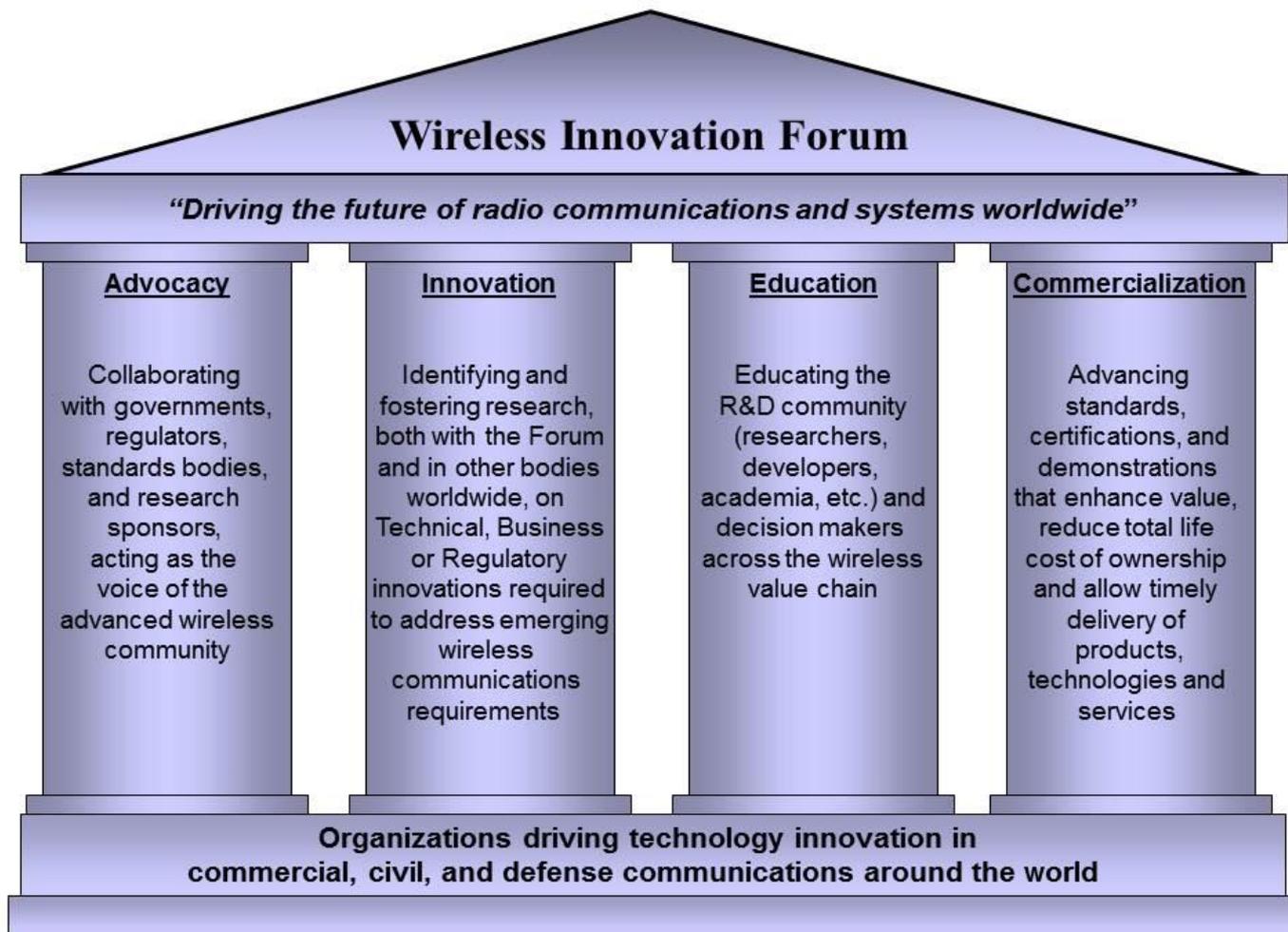
THALES

Board of Directors

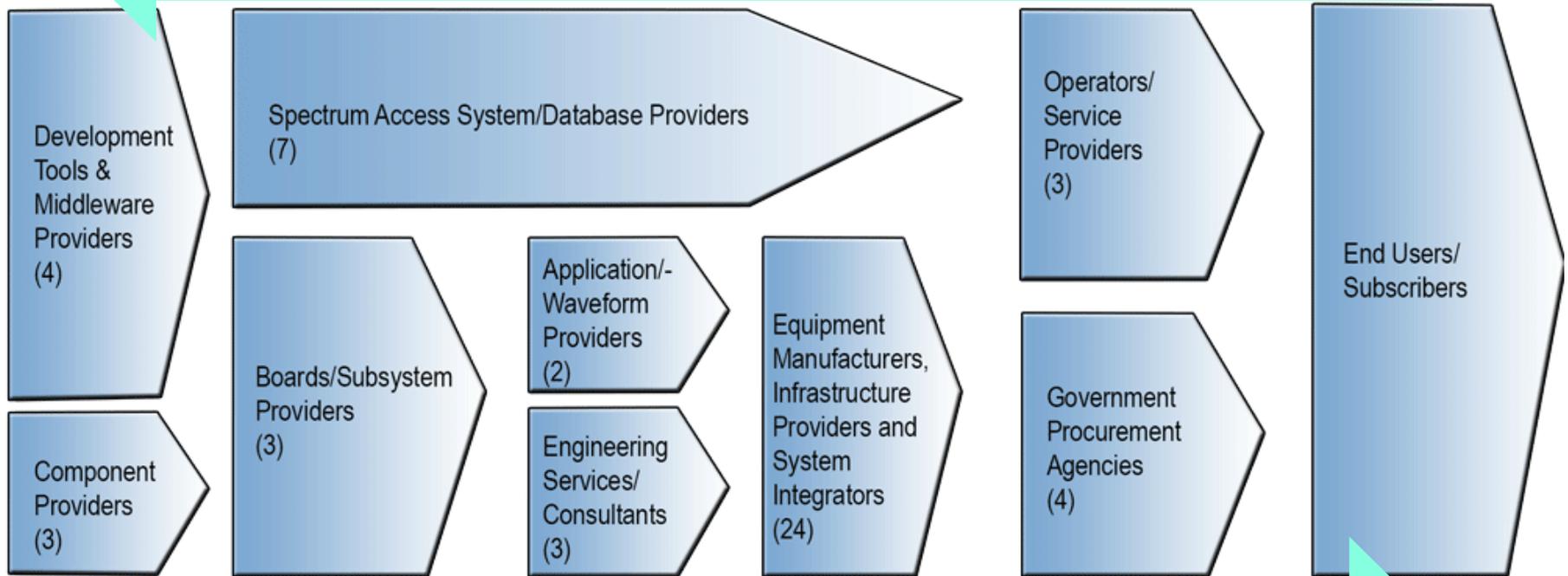
Position	Director	Organization
Chair of the Board of Directors	Manuel Uhm	Ettus Research
Forum Chair/President	Bruce Oberlies	Motorola Solutions
Forum Vice-Chair/ Vice President	Raghavan Muralidharan	Tata SED
Secretary	Al Jette	Nokia
Chief Financial Officer/Treasurer	Ken Dingman	Harris
Chief Technology Officer	Claude Belisle	NordiaSoft
Chief Marketing Officer	Vacant	
Chief Regulatory Officer	Preston Marshall	Google
Class Directors		
Large Company	David Hagood	Cobham
Medium Company	Alberto Quintana	Indra
Small Company	Kurt Schaubach	Federated Wireless
Government/Non Profit	Paul Anuszkiewicz	CTIA
Academic	Linda Doyle	CTVR
At Large Directors		
General	Claudio Armani	Selex ES
General	Mark Gibson	Comsearch
General	Doug Knisely	Qualcomm
General	Glenn Laxdal	Ericsson
General	David Renaudeau	Thales
General	Darcy Swain-Walsh	MITRE
General	Neeti Tandon	AT&T

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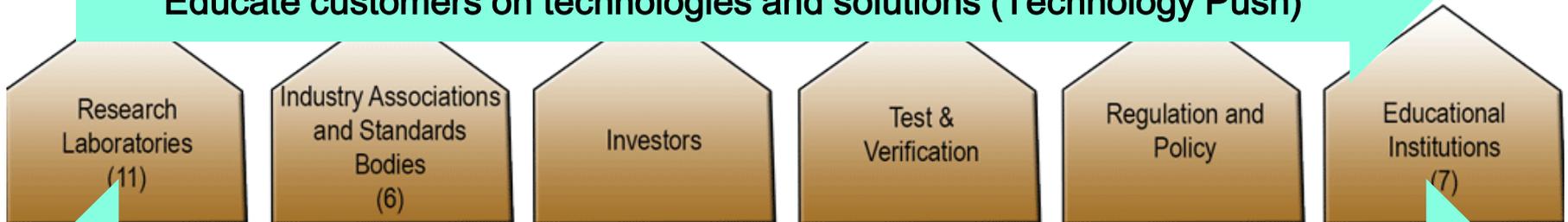
Pillars of Strategy



Educate technology suppliers on roadmap requirement (Market Pull)

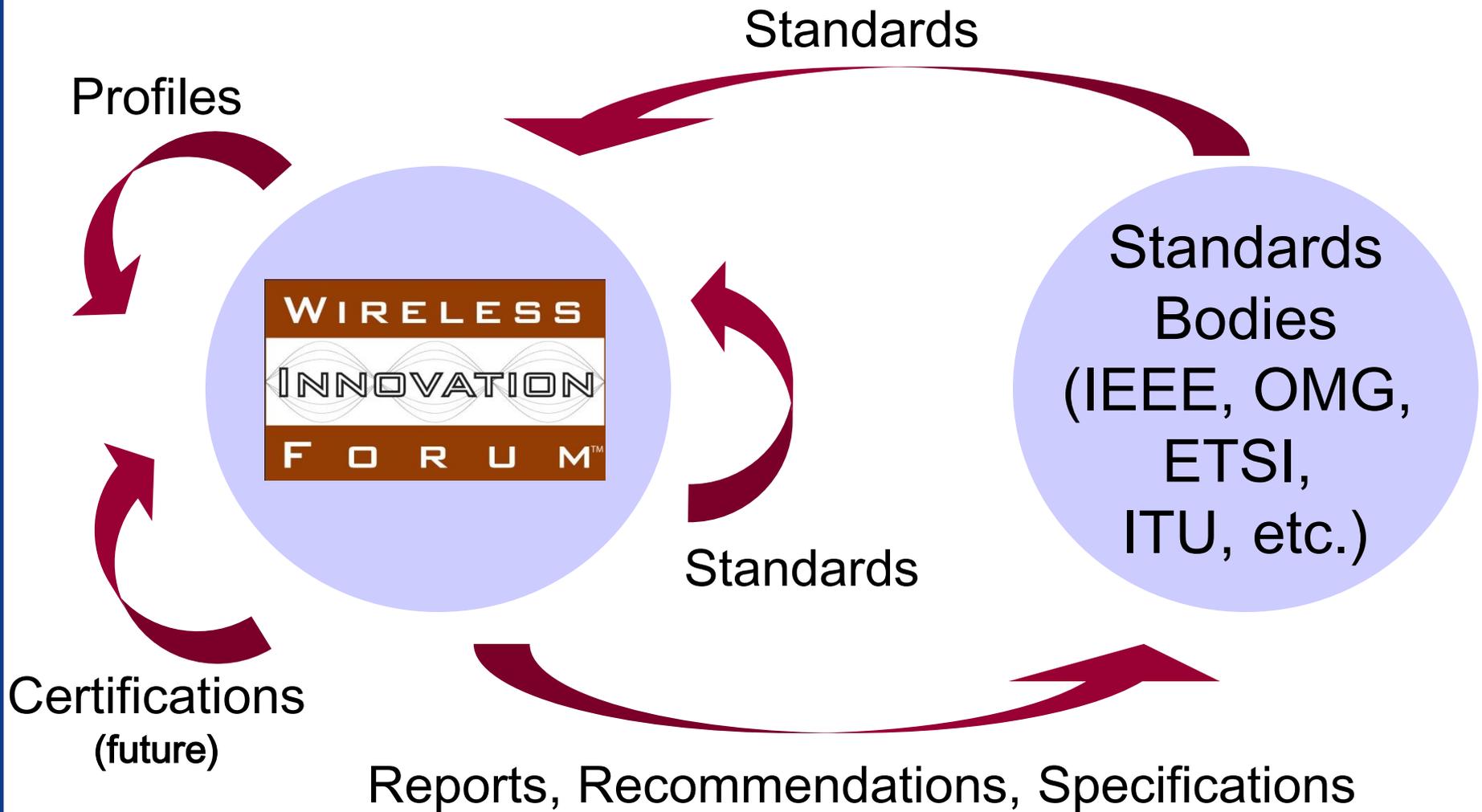


Educate customers on technologies and solutions (Technology Push)



Educate Research, Standards and Regulation Bodies From All Levels of the Value Chain

The Forum's Collaborative Model



Memberships and Partnerships



Wireless Innovation Forum Memberships and Partnerships



FY2016 Downloads

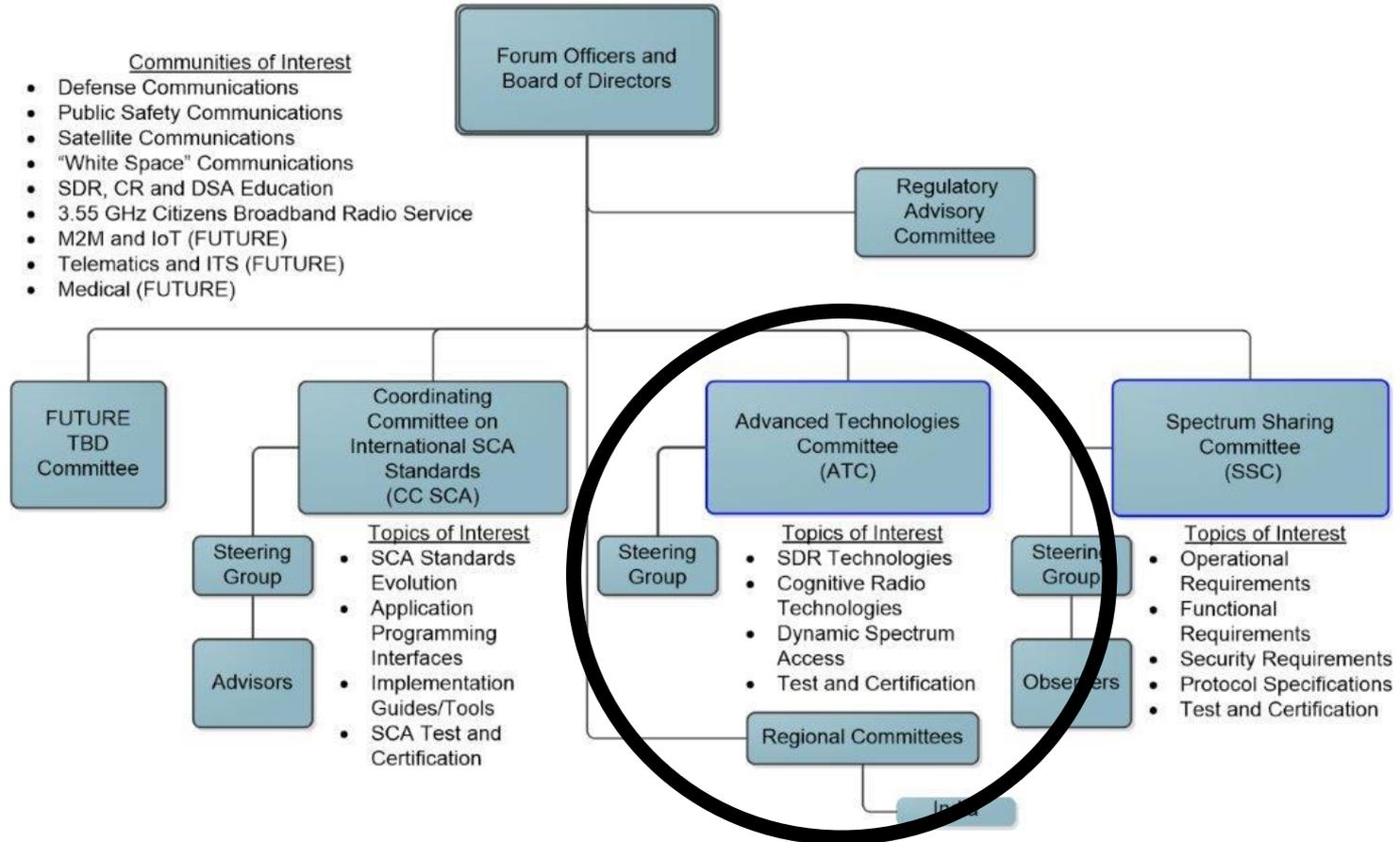
Conference Proceedings	49,825
Work Products	
• Reports	18,091
• Recommendations	17,426
• Specifications	5,338
Market Studies	2,929
SCA Standards Portfolio	3,808
Other	39,525
Total	145,202

<http://www.wirelessinnovation.org/knowledge-center>

Forum Structure

Organizational Structure for The Wireless Innovation Forum

10 November 2015



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Top 10 Most Wanted Wireless Innovations

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

Innovation #2: Network Management of Mobile Ad-Hoc Radios

Innovation #3: 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

<http://www.wirelessinnovation.org/top-ten-wireless-innovations>

The Forum's Advocacy Agenda: Improving the Utilization of Spectrum

Dynamic Situational
Prioritization

Minimizing Regulatory Barriers
to Entry

Technology and Service
Neutrality

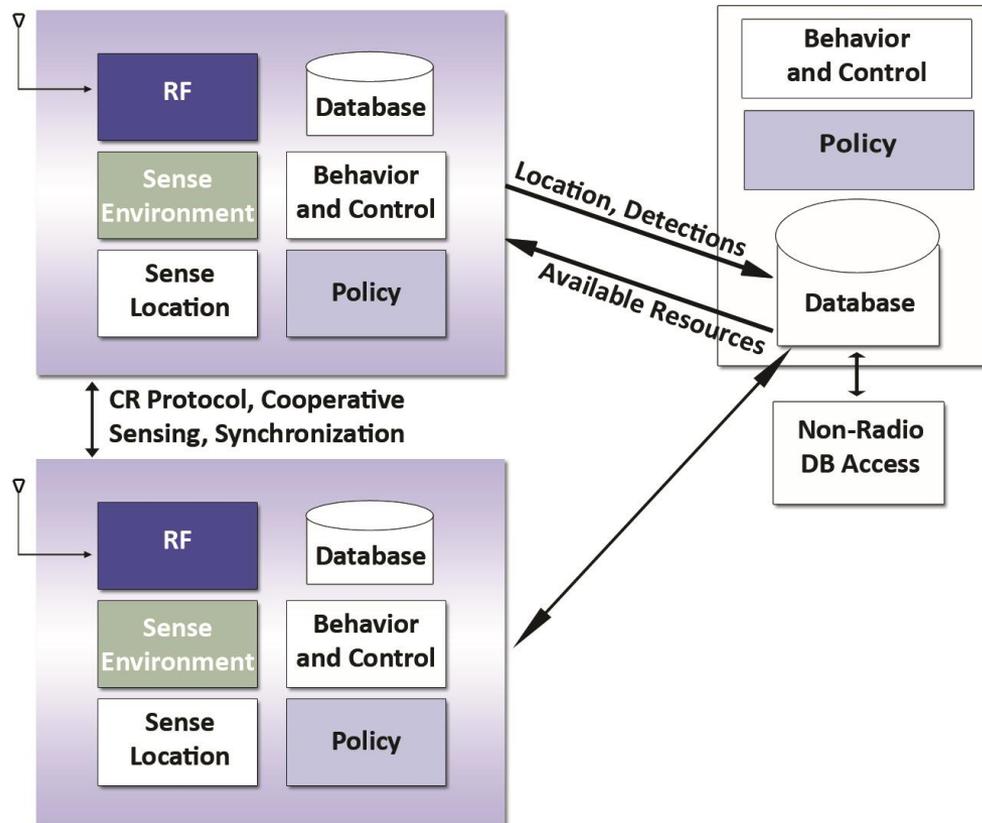
Licensed, Unlicensed, Sharing
and Hierarchical Models

Minimum Technical Restrictions
Harmonized Standards

Networked and Synchronized
Databases

Spectrum Sensing

Receiver Specifications



<http://www.wirelessinnovation.org/advocacy-agenda>

FY2016 Accomplishments

WINNF-16-P-0019-V1.0.0 Context for Cognitive Radio Based Public Safety Communications Systems

WINNF-16-R-0058-V1.0.0 Response to Ofcom Call for Information on 3.8 GHz to 4.2 GHz

FY2017 Plans

Receiver Performance Guidelines and Evaluation Criteria

Update to the Advocacy Agenda

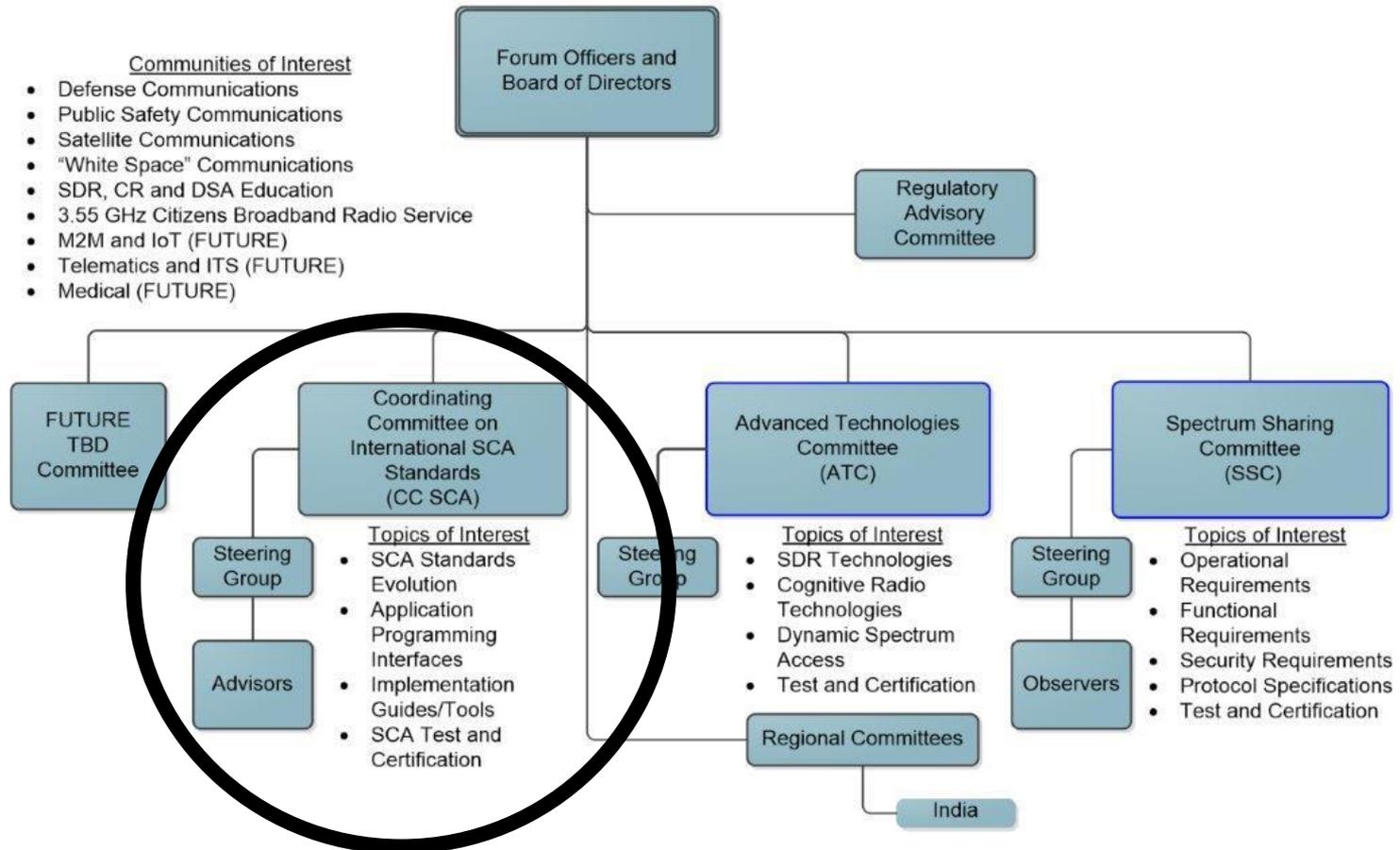
Update to the Top 10 List

Execute on Platform Strategy

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CC SCA Mandate

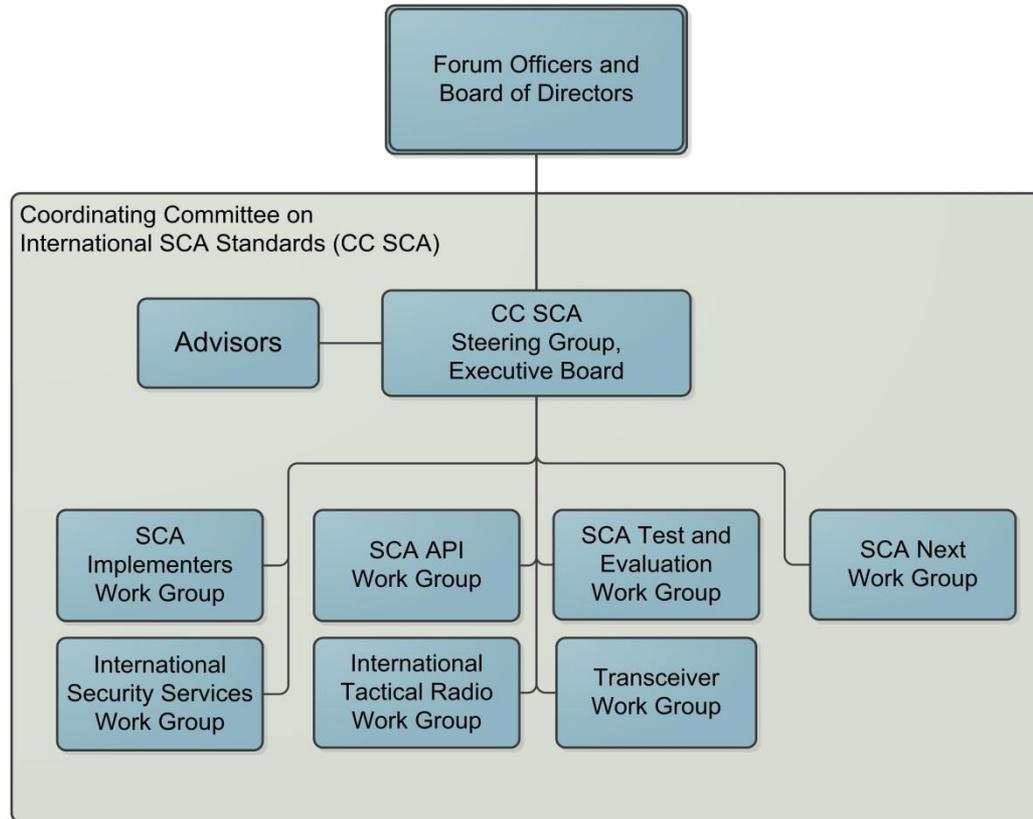
To support the harmonization of the SCA standards at the international level for the mutual benefits of all stakeholders to include:

- Defining an industry driven SCA evolution roadmap for the international community
- Profiling the SCA specification and related APIs to define internationally accepted variants that are hosted by the Forum
- Developing extensions to the SCA standards that address any gaps between the defined SCA evolution roadmap and Forum accepted SCA specification variants
- 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

17 April 2013



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The CC SCA is led by a Steering group of worldwide tactical radio manufacturers



CC SCA Advisory Council

Grouping together the Steering Group and CC SCA Advisors

- Answering to the essential need of a venue for manufacturers and customers to interact
- Met at least twice a year since creation (~2011)
- Now delivering beyond expectations: Advisory Council enabled the normative referencing of WinnF PIM IDL Profiles by SCA 4.1

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, EDA, NATO
- Appointed upon invitation issued by the Steering Group

WinnF Standards for SDR

Standards serving SDR in the general sense

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



SCA 2.2.2 and 4.1

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

Policy setting efforts underway

- Web-based Issues collection mechanism, open to all
- Architecture Board operation in installation
- Branding strategy under development, with specific logos under final validation

FY2016 Accomplishments

REPORTS

WINNF-16-P-0025.V0.6.0 (IR1) SCA 4.1 Compliance 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

FY2017 Plans: SCA 4.1 compliancy

Started early 2015 aiming for completion end 2016

Chaired by JTNC Standards

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

**Interim deliveries already available (on partial
scope)**

FY2017 Plans: Transceiver Next

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

Coalition interoperability

Started early 2015 aiming for completion end 2016

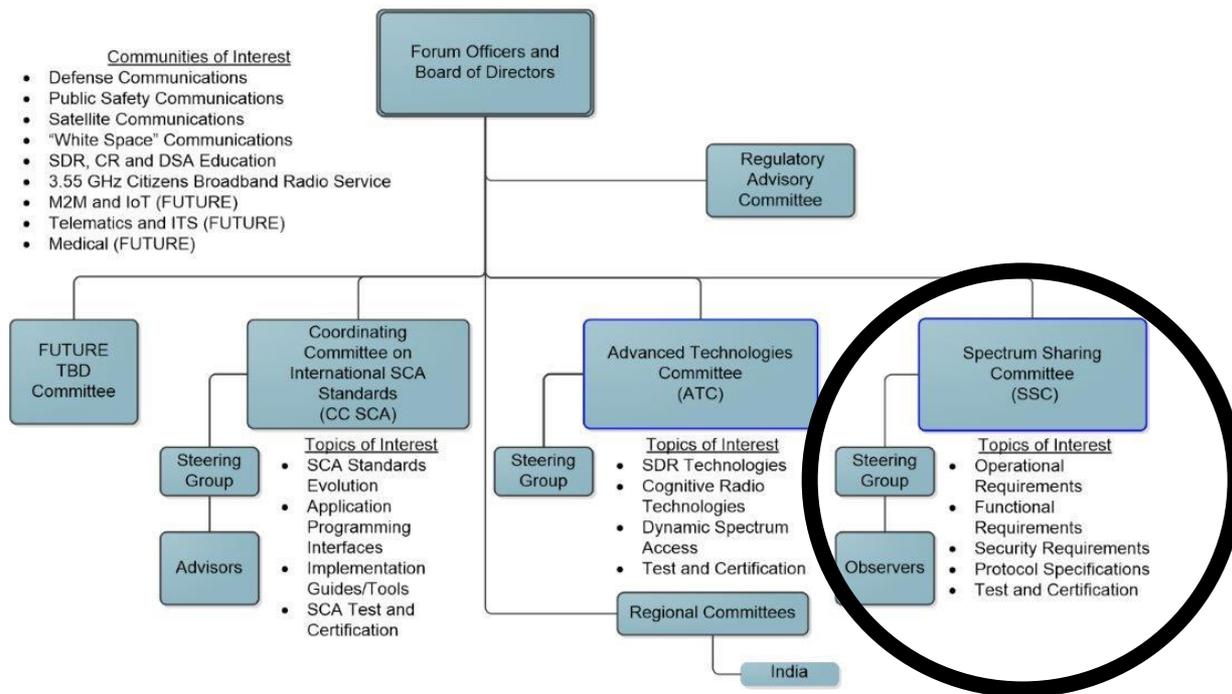
Project to deliver exploratory report identifying technology / standards gaps for coalition contexts

Contributions and involvement from government stakeholders remain welcome (NATO countries and beyond)

Forum Structure

Organizational Structure for The Wireless Innovation Forum

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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.**

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Spectrum Sharing Committee: Scope

The main activities that will be 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

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Participation to Date – 200+ People, 50+ Organizations

Members

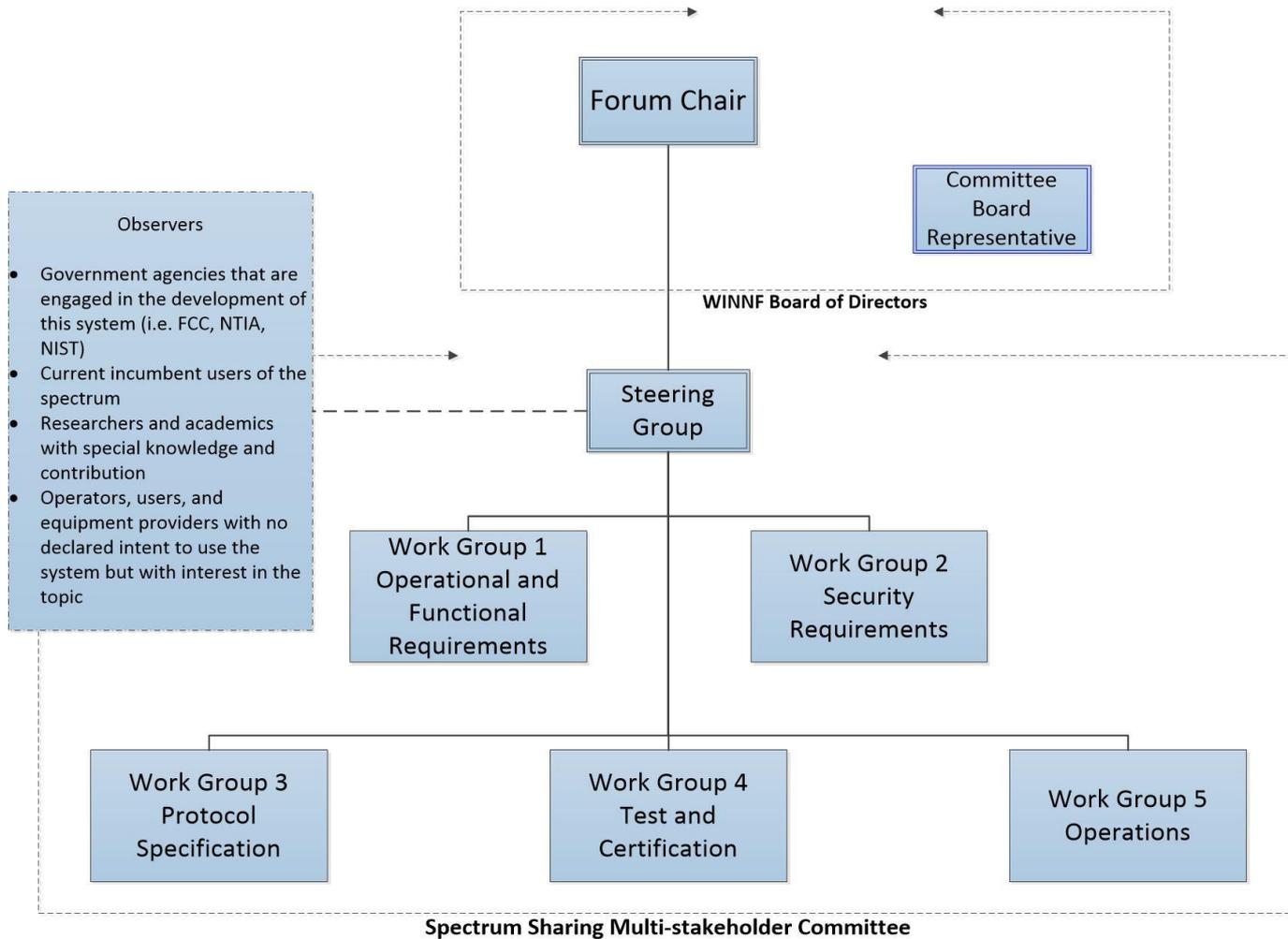
- Airspan Networks
- Amdocs
- Astrapi
- AT&T*
- Cable Labs
- CTIA*
- Communications Research Centre, Canada
- ComSearch*
- Ericsson*
- Federated Wireless*
- Google*
- Harris Corporation
- Huawei*
- Idaho National Labs
- Intel
- ITS (NTIA)
- Key Bridge Global*
- LGS Innovations
- LS Telcom
- MITRE
- Motorola 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



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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

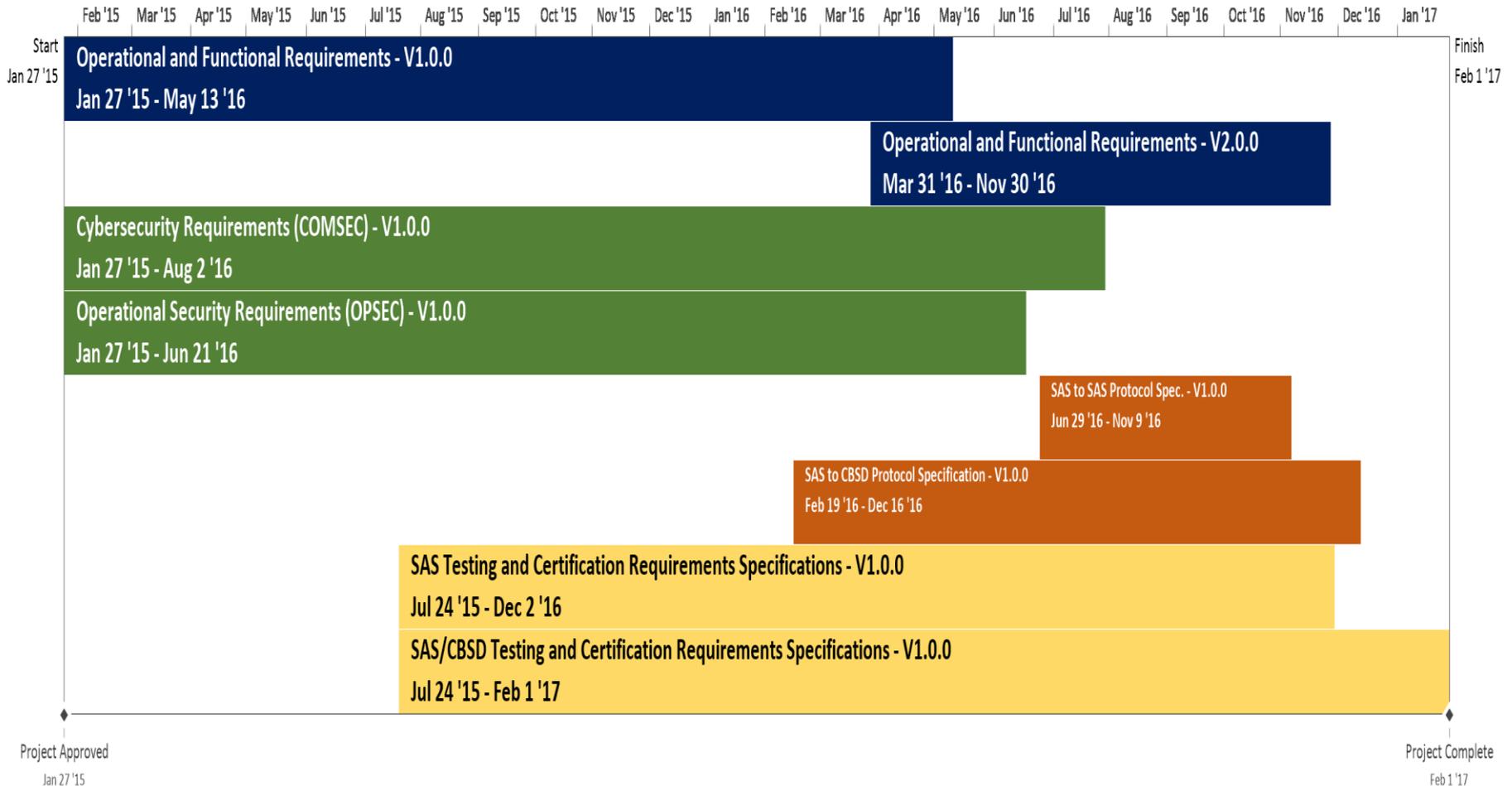
WINNF-15-R-0200-V1.0.0 WinnForum Comments on 2650 Protection Contours

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

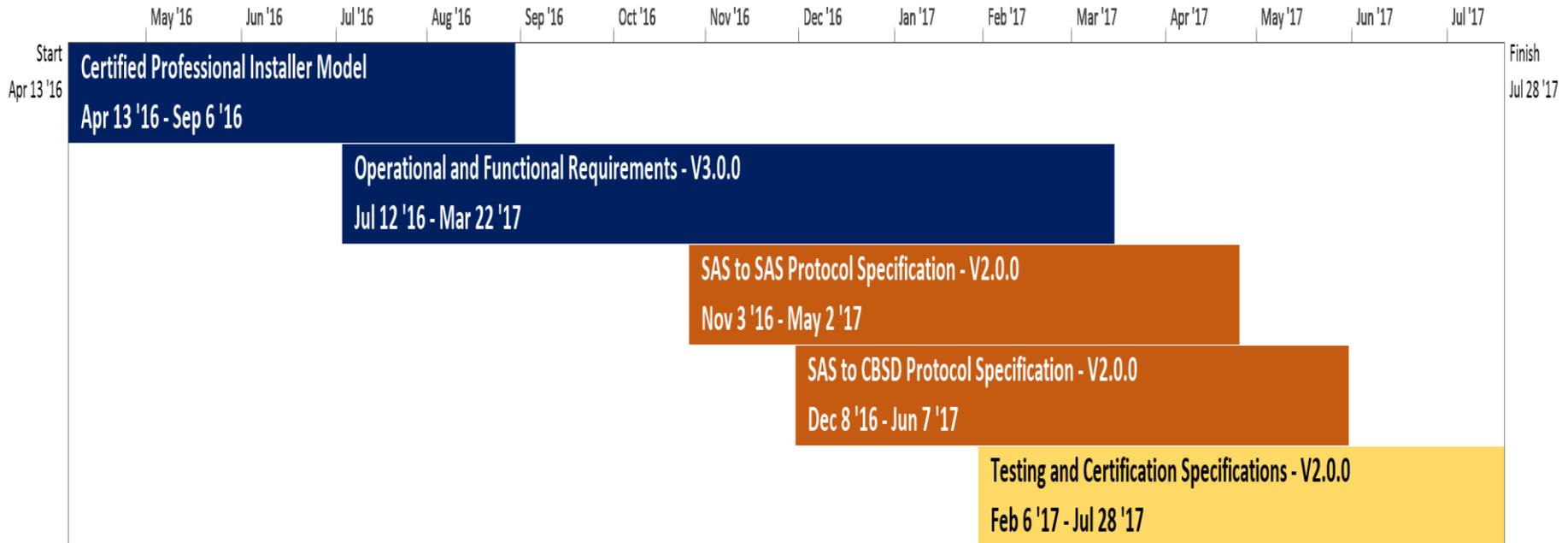
WINNF-15-R-0045-V1.0.0 WinnForum Comments on the Report and Order

Release 1 Publication Timeline



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Release 2 Publication Timeline



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GET INVOLVED – JOIN THE FORUM

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Elements of The Forum's "Commercialization Framework"

As a representative of a member organization, you can ...	Benefit/Value to the Member
Initiate and lead market focused work groups, task groups or special interest groups	to drive the creation of reports, recommendations and specifications that incubate and advance new technologies that are important to your organization.
Leverage the Forum's proven development process and IPR policy	to rapidly advance projects that will get these innovative technologies to market.
Collaborate with other member representatives from leading organizations across multiple market segments and at all levels of the wireless value chain	to quickly build an ecosystem of organizations interested in gaining economies of scale in supporting these technologies through standards based interoperation.
Leverage the Forum's flexible membership model	to expand this new ecosystem to include all relevant stakeholders.
Leverage the Forum's reputation as a "honest broker" in presenting technology	to educate regulators on issues important to our organization in establishing this new ecosystem.
Leverage the Forum's partnerships, US and European conferences, webinars and web presence	to promote the adoption of your ecosystem's technologies, guidelines and standards.

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Testimonials

“The Wireless Innovation Forum has long been, and continues to be, the center of mass for standards and architectures that drive the development of Software Defined and Cognitive Radios for the communications industry,” says [Datron’s](#) Bob Schutz. “Datron is committed to providing its commercial, civil and military customers with state of the art communications platforms. Datron’s membership in The Wireless Innovation Forum is an acknowledgement of this commitment and the continued value, we see in the activities of The Wireless Innovation Forum.”

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Testimonials

“Five out of six a4ESSOR Main Subcontractors were already members of the Forum. a4ESSOR’s main role/interest is therefore to coordinate their contributions to the Forum in relation to ESSOR products,” said Ugo Manetti, President of [a4ESSOR](#). “We firmly in fact believe that the Forum can offer an extraordinary opportunity, worldwide, for technical exchange in the SDR field and related matters.”

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Testimonials

"The Wireless Innovation Forum provides Kolodzy Consulting LLC the forum in which to address the regulatory and technical issues for next generation radios," says Paul Kolodzy, of [Kolodzy Consulting LLC](#). "The onset of more dynamic capabilities within radios and radio networks has created the need for such focused industry-led efforts."

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Testimonials

“Scientific exchange is an important factor for research,” says Ute Miller of [RWTH Aachen University](#). “The WInnForum is the ideal forum for the research areas of UMIC.”

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Testimonials

"We are pleased to be a part of this important organization, which includes some of the world's leading technology innovators in the field of wireless spectrum," said Johanna Dwyer, General Manager of Federated Wireless.

Find out More

www.WirelessInnovation.org



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Driving the future of radio communications and systems worldwide

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