

Model for Coordination of International SCA Standards

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Acronyms and Abbreviations

Acronym or Abbreviation	Meaning
DoD	Department of Defense
ESSOR	European Secured Software Radio
ETSI	European Telecommunications Standards Institute
ISO	International Organization for Standardization
JPEO	Joint Program Executive Office
JTRS	Joint Tactical Radio System
MoD	Ministry of Defense
OCCAR	Organisation for Joint Armament Cooperation <i>[French: Organisation Conjointe de Coopération en matière d'Armement]</i>
OCCAR-EA	Executive Administration of OCCAR
OMG	Object Management Group
SDO	Standards Development Organization
WInnF	Wireless Innovation Forum

Table 1: Acronyms and Abbreviations.

Model for Coordination of International SCA Standards

Executive Summary

This report provides a Model for Coordination of International SCA Standards organized around the Wireless Innovation Forum Coordinating Committee on International SCA Standards, structured according to two mainstream axes: Coordination of International SCA Standards as such and Production of coordinated International SCA Standards.

It provides clarifications concerning the scope of International SCA Standards and an overview of the current status of International SCA Standards development, with an associated vision as delivered by early members of the Advisory Council (JTRS JPEO and OCCAR-EA ESSOR Programme Division).

The Coordination of International SCA Standards is taking place thanks to a close working relationship among a number of Wireless Innovation Forum members (the Steering Group) and a number of key government stakeholders (the Advisory Council). Typical activities supporting Coordination are described, such as model definition, roadmap elaboration or suggestion of specific production activities.

The Production of coordinated International SCA Standards is exposed through a number of possible activities (Open Custodianship, International Liaison, Ratification and Harmonization), possibly conducted by a number of bodies depending on the particular cases (the WINNF as such or partner organizations such as ETSI or OMG).

The role of the Forum as long-term supporter of International SCA Standards is described as an additional asset to ensure success of coordinated International SCA Standards.

This open and global collaboration model sets the basis for future decisions to be taken for better harmonization among existing SDR specifications and standards and evolution towards a suite of harmonized standards.

1 Introduction

1.1 Problem statement

The Software Communications Architecture (SCA) and the associated APIs (Application Programming Interfaces) and Extensions --- the International SCA Standards this document is about --- have reached a critical phase in their evolution.

Standards are multiplying

The JTRS JPEO has undertaken a new project, “SCA Next”, with the stated objective to evolve SCA 2.2.2 and “position the SCA as a specification that is comprehensive yet flexible enough to provide a technical foundation for multiple generations of JTRS and industry products”¹. Some European Nations are also moving down a similar path, with the ESSOR program, a contract held by the national industrial companies of six European Defense Agency participating member states “complementing the SCA 2.2.2 to produce a complete SDR architecture definition”², aimed for publication and standardization. Similarly, the US Army has undertaken a project, referred to as the “Government Reference Architecture”, that builds on SCA 2.2.2 to provide a common software architecture suitable for use in advanced MILSATCOM terminals³. There are other national and regional programs taking similar paths.

Risk of global and local inefficiency

Such divergence in the evolution of the SCA is inherently inefficient, with the potential for multiple organizations to expend scarce resources in solving the same problem and achieving the same results. In addition, divergence of the SCA along these closed paths without coordination has the potential to create significant incompatibilities between the final architectures. Should this occur, economies of scale will be lost and the costs associated with developing and deploying radio products supporting SCA based technologies will rise, resulting in an increased cost to procurement authorities worldwide. This can also increase individual program cost since manufacturers supporting these standards will have to develop multiple versions for each program version, resulting in a loss of economy of scale and increased cost to their customers.

Moving towards a harmonized suite of international SCA standards

Placing as much as possible of the developed specification into the public domain provides the best path to reduce radio life cycle cost via the economies of scale derived from a larger market base for SCA based technologies.

1.2 Need for a specific Coordination Model

The model for addressing these types of issues in the commercial wireless industry is well established: a **standards body** develops the base standard, and then an **industry association**

¹ <http://jpeojtrs.mil/JPEO-NR-2009-005.pdf>

² <http://groups.sdrforum.org/p/do/sd/sid=583&type=0>

³ <http://www.sdrforum.org/pages/whatsNew/jun09meeting.asp>

becomes the custodian of that standard, defining profiles of the standard that address market specific needs and certifications against those profiles to ensure interoperability across a broad base of commercial vendors.

Examples abound: IEEE 802.16 and the WiMAX Forum, ETSI UMTS and 3GPP, IEEE 802.11 and the WiFi Alliance. This model works because the market for the end product is sufficiently large that there is incentive to invest in participation in the standardization effort.

Transposition of such models in the SCA eco-system is far from being evident due to a number of strong specificities of the SCA eco-system.

First, acquisition programs are acting as **standard bodies**, since they directly produce and issue reference SCA standards. Second, acquisition programs are the customers of radio products and systems based on international SCA standards, and should therefore be part of any **“industry” association** related to SCA standards. To a certain extent, this particular position of procurement stakeholders in the SCA eco-system is reflected by the presence of a number of them as members of the WinnF as the reference SCA industry association.

The model proposed in this document, taking into account the previous specificities, is enabling the entirety of SCA eco-system stakeholders (defense industry and government stakeholders) to work together within the WinnF, leveraging the best from the standards body / industry association paradigm, with the aim to prepare the ground for emergence of a harmonized suite of SCA standard.

1.3 Organization of the document

The document is organized in the following way:

- § 2 – Status of International SCA Standards,
- § 3 – Coordination of International SCA standards,
- § 4 – Production of coordinated International SCA standards,
- § 5 – Support to coordinated International SCA standards,
- § 6 – Conclusion,
- § 7 – Annexe A – Articulation with WinnF strategy relative to Standards,
- § 8 – Annexe B – WinnF Document Development Process.

Chapter 2, “Status of International SCA Standards”, provides the exact meaning of International SCA Standards as considered throughout this document, then gives an overview of the status of international SCA standards development. Finally, the section provides considerations on the essential role of acquisition programs such as JTRS and ESSOR in the perspective of further coordination.

Chapter 3, “Coordination of International SCA standards”, describes the parts of the model related to coordination of the strategic aspects of international SCA standards evolution through WinnF Coordinating Committee on International SCA Standards Steering Group and Advisory Council.

Chapter 4, “Production of Coordinated International SCA Standards”, gives perspectives concerning the production of coordinated international SCA Standards as it is currently happening and subject to happen in some future. It presents how such activities could take place, depending on specific need, within the WinnF or a partner Standards Development Organization such as ETSI or the OMG.

Chapter 5, “Support to Coordinated International SCA Standards”, presents the activities being undertaken by the WinnF as the premier Forum supporting usage of international SCA Standards.

Chapter 6, “Conclusion”, identifies a number of issues and perspectives in front of the main contents of the document.

Chapter 7, “Annexe A – Articulation with WinnF Strategy relative to Standards”, presents the WinnF general strategy regarding to standards and elaborates on how this model supports this strategy.

Chapter 8, “Annexe B – WinnF Document Development Process”, provides an overview of the WinnF process that is governing elaboration of any WinnF-approved document, from high-level reports like this document down to technical specifications or standards.

1.4 Role of the Advisory Council in document preparation

1.4.1 Contribution regarding the coordination model

The document has been approved by the WinnF membership from a submitted work product prepared by the Steering Group of the Coordinating Committee for International SCA Standards, in coordination with the Advisory Council.

Members of the Advisory Council that participated to this coordination effort were representatives from Joint Program Executive Office, Joint Tactical Radio System (JPEO JTRS), OCCAR-EA ESSOR Programme Division (ESSOR PD), the contracting authority of the ESSOR Program and the European Defense Agency (EDA).

Before it was submitted to approval by voting organizations of the Steering Group, this document was circulated as working draft V0.2.9 for explicit check by Advisory Council members, to make sure that a consensus is achieved on the general approach, as described herein.

The adoption process by WinnF membership then brought no noticeable modifications from the version prepared by the Steering Group and the Advisory Council.

1.4.2 Perspectives regarding the coordination model

The visions expressed hereunder were provided by JTRS JPEO and OCCAR-EA PD as the early participants of the Advisory Council that were involved in elaboration of the working version of this document that entered WinnF approval process.

“JPEO JTRS agrees in principle with the need for international coordination of SCA standards. Wider international adoption of the standard will result in a larger SCA user base, resulting in better products for everyone. The U.S. Department of Defense (DoD) program further agrees to solicit participation from the international community to facilitate improvements and updates to the specifications. However, it should not be expected that the DoD will transfer ownership and configuration control of SCA and related standards in the immediate future. It is likely that DoD leadership will observe the performance of this Coordinating Committee over a period of time before making a decision to transition control and configuration management.”

“OCCAR-EA and the ESSOR Nations agree in principle with the need for international coordination of SCA standards. Wider international adoption of the standard will result in a larger SCA user base, resulting in better products for everyone. OCCAR-EA and the ESSOR Nations further agree to solicit participation from the international community to facilitate improvements and updates to the specifications. However, it should not be expected that the ESSOR Nations will transfer ownership and configuration control of the ESSOR Architecture and related standards in the immediate future. It is likely that OCCAR-EA and the ESSOR Nations leadership will observe the performance of this Coordinating Committee over a period of time before making a decision to transition control and configuration management.”

2 International SCA Standards

2.1 Notion of “International SCA Standard”

2.1.1 Definition and clarifications

The terminology “International SCA Standard” as used in this document is to be understood in a broad and general sense that can be defined as *any publicly available technical specification inspired by SCA aiming to serve as common reference for definition of SDR architectures*.

A specification is, for example, defined by ASTM International (formerly the American Society for Testing and Materials) as: “An explicit set of requirements to be satisfied by a material, product, or service”.⁴ Most “International SCA Standards” as defined beforehand fall in that category, in the sense that they are specifying elements of the SDR Architecture.

The usage of the “International” terminology underlines that the origin of the concerned technical documentation can be from any part of the world, and that the ambition of the concerned technical documentation is to be supported and used by an international basis of users.

The usage of the “SCA” terminology captures that the SCA as defined and published by the JTRS program has been one essential impulsion to emergence of standardized SDR architectures. It should be clear, though, that the association “SCA Standard” is referring to a much broader set of technical documentations than the SCA itself.

The usage of “Standard” terminology has been chosen since it reflects a *de facto* usage by the SCA community to capture that the considered specifications:

- Can serve as a **common reference** among different actors of the SDR eco-system,
- Should evolve when needed towards standards of high level of **recognition**.

The next sections provide detailed elements in front of those two perspectives.

2.1.2 Standards as common references

In a commonly agreed sense, the “standard” terminology is applied to technical specifications serving as a common reference for a given community⁵.

Such technical specifications can be elaborated and maintained through *closed* or *open* process, resulting to introduction of notion of “closed standard” and “open standards”.

Closed custodianship is typically followed by a given corporation, regulatory body or military organization. Participation is generally by invitation only, even if the resulting specification is openly available and widely followed. Products are sometimes referred to as “closed standards”.

⁴ <http://www.astm.org/COMMIT/Regs.pdf>

⁵ <http://assessment.cetis.ac.uk/FAQs/FAQs/Basics/specification%20v%20standard>

Open custodianship typically reflects elaboration of specifications by a Standards Development Organization, granting a number of possibilities for any member organization to participate in specification elaboration. Products are often referred to as “open standards”.

The ISO definition of an open standard is: “A document established by consensus and approved by a recognized body that provides for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context”⁶.

2.1.3 Standards as recognized specifications

Another commonly agreed signification of the “standard” terminology is that it shall reflect a specification that has reached a certain level of recognition, thanks to adoption by SDO capable to produce normative standards.

By normative standard, or norm, is meant a standard with a particular status that enables it to serve as basis for definition of legal dispositions by some governmental authorities. Only a number of SDOs are subject to see their products recognized as norms, and they typically differentiate from the political entities they are related to:

- National norms (e.g. ANSI for USA, DIN for Germany, AFNOR for France, BSI for UK, UNI for Italy, AENOR for Spain...),
- Regional norms (e.g. ETSI for Europe...),
- Worldwide norms (e.g. ISO).

The standards produced by SDO that are not subject to see their products recognized as norms are referred to as “voluntary standards”. The specifications produced by the IEEE, the OMG or the Wireless Innovation Forum⁷ belong to this category.

One type of coordination of International SCA Standards presented later in the document is called Ratification, and consists of turning a given voluntary standard into a standard adopted by a SDO capable to produce normative standards.

2.1.4 Intellectual Property aspects

This section aims to provide basic clarifications concerning intellectual property aspects attached to international SCA standards.

In general, the Intellectual Property (IP) contained within a specification may not be openly available⁸, and may be available under many different licensing agreements. Specifications and standards publically released by Standards Development Organizations all have “**rights**” defined regarding how the standards can be used. These rights are often limited to “**copyright**” but may have an associated “**licensing agreement**” with rights associated with the development of derivative works often included. Usage of the standard is generally made available under “Fair,

⁶ <http://www.iso.org/iso/standardsandconsumer.pdf>

⁷ The Software Defined Radio Forum Inc. is registered with the US Government as a Standards Development Organization: <http://edocket.access.gpo.gov/2004/pdf/04-25853.pdf>

⁸ http://p2pfoundation.net/Closed_Standard

Reasonable And Non-Discriminatory (FRAND)” terms that include moderate applicable licensing fees. The importance of not asking for excessive payments to use the IP required to implement a standard is known in order not to limit adoption of the related technology.

For known and published international SCA Standards, the generalized practice is that the usage of the standards is free of any charge. This contrasts significantly with the IPR associated to waveforms involved in SDR programs, where many different models are applied.

To date, all intellectual property related to the SCA that is publicly available has been released for usage without royalty (free of charge) and there is no indication that this practice will change in the future.

2.2 Status of International SCA Standards

The technical specifications covered in this section answer to the broad and inclusive definition of “International SCA Standards” as introduced in previous chapter (See Table 3).

The covered specifications or standards can be in development or already published.

While public domain accessibility remains a key factor to optimize software reuse and leverage SDR development, it must be acknowledged that because some of these standards relate directly to security requirements for national defense, they are prevented from release into the public domain. Issues related to disclosure are not discussed in this document, which does not aim to provide reasoning or issues regarding what should be public and what should not.

2.3 Importance of Acquisition Programs

The particular role of Acquisition Programs with regards to standardization is to a large extent specific to the SDR domain comparing to other areas of communication standardization, since programs like JTRS and ESSOR provide suites of specifications with the aim to have them agreed upon as standards.

This can happen following non-closed or closed approaches, with affirmed willingness to evolve towards non-closed approaches. Future decisions that may be taken by those programs are not discussed further in this document, which does not aim to provide suggestions or recommendations of any kind regarding what should happen for better harmonization.

This key role is one essential driver for having representatives from acquisitions programs that produce international SCA standards being invited as participants to the Advisory Council.

Custodian	Specifications/ Standards	Process	Availability
JTRS JPEO	SCA 2.2.2 ⁹	Closed.	Open
	SCA Next ¹⁰	Closed decision. Public Liaison in place for comments and contribution gathering with Wireless Innovation Forum.	In Development Open access to Draft SCA Next.
	SCA Extensions	Closed.	Open
	JTRS APIs ¹¹	Closed.	Partially Open
ESSOR Participating States	ESSOR Architecture ¹²	Closed	Some contributions made available for SCA Next through the Wireless Innovation Forum. Some contributions announced for Transceiver Facility.
US Army CERDEC	Government Reference Architecture	Closed	Closed
NASA	Space Telecommunications Radio Service (STRS)	Closed	Some public release for comment through the Wireless Innovation Forum ¹³
Object Management Group	UML Profile for Software Radio ¹⁴	Open	Open
	CORBA		
Wireless Innovation Forum	Software Radio Architecture Version 2.1 (SCA Version 0.9) ¹⁵	Open	Open
	PIM and PSM for Smart Antenna (With OMG) ¹⁶	Open	Open
	Transceiver Facility Specification ¹⁷	Open	Open
	International Radio Security Services API	Open	In process

Table 2: Summary of status of International SCA standards.

⁹ <http://sca.jpeojtrs.mil/sca.asp>

¹⁰ <http://sca.jpeojtrs.mil/scanext.asp>

¹¹ <http://sca.jpeojtrs.mil/api.asp>

¹² <http://groups.winnforum.org/p/do/sd/sid=2635>

¹³ <http://groups.winnforum.org/d/do/1581>

¹⁴ <http://www.omg.org/spec/SDRP/1.0>

¹⁵ <http://groups.winnforum.org/d/do/1725>

¹⁶ <http://groups.winnforum.org/d/do/1555>

¹⁷ <http://groups.winnforum.org/d/do/1554>

The Wireless Innovation Forum intends that the defined model provides for flexible and efficient coordination facilitating a suite of International SCA Standards through the following activities:

Coordination between the Steering Group and the Advisory Council of the Coordinating Committee, since these Government stakeholders in represent for a number of them key contributors to international SCA Standards, while most of them are in position to procure in more or less near terms SDR products based in coordinated International SCA Standards.

Production of coordinated international SCA Standards includes classical standards custodianship, international liaison with some acquisition programs and harmonization activities among a number of existing standards and specifications.

Support to coordinated International SCA Standards is therefore likely to increase thanks to additional activities being undertaken by the Wireless Innovation Forum as an association of key SDR stakeholders from industry and governments.

3 Coordination of International SCA Standards

This chapter addresses the way **Coordination** of International SCA Standards happens in the frame of the proposed model. Coordination is one pillar of the proposed model that is complemented by **Production** of coordinated standards as addressed in § 4 and **Support** to coordinated International SCA Standards as addressed in § 5

Coordination aims to orient in the most appropriate direction the decisions to be taken for **Production** of coordinated standards to happen., in conjunction with necessary Support activities.

The **Steering Group** and the **Advisory Council** of the WINNF Coordinating Committee on International SCA Standards are the key actors of Coordination.

3.1 Expectations towards a Coordinating Body

There is a need to set up a Coordinating Body with all stakeholders on board to help to fulfill the need for coordination of International SCA Specifications.

The following expectations are identified for this Coordinating Body:

- It should provide **reports describing issues and proposing solutions** on the way to coordinate evolution of international SCA standards,
- It should define and maintain a **coordinated roadmap** for SCA standards evolution. This roadmap shall be developed in partnership with all relevant stakeholders,
- It should **encourage/foster technical collaboration** between the various development organizations to **harmonize SCA based specifications** to the greatest extent possible, to **minimize** repetition of effort and **maximize** return on investment for various developments (see Figure 1),
- It should set the basis for **production of coordinated standards** to be realized,
- It should **work with partner standard development organizations (SDO)** as required to support the SCA community in turning specifications into approved standards, ensuring that changes made during the standardization are **minimized to the greatest extent possible** (known case: introduction in 2002 by JTRS JPO of SCA 2.2 to the OMG),

In order to support the coordinated International SCA Standards, the Coordinating Body:

- Should provide **reference repository for distribution of public releases of specifications and standards** from the various development organizations,
- Should **identify preferred SCA based architecture implementations** and propose those implementations as **standards to be maintained** when appropriate.

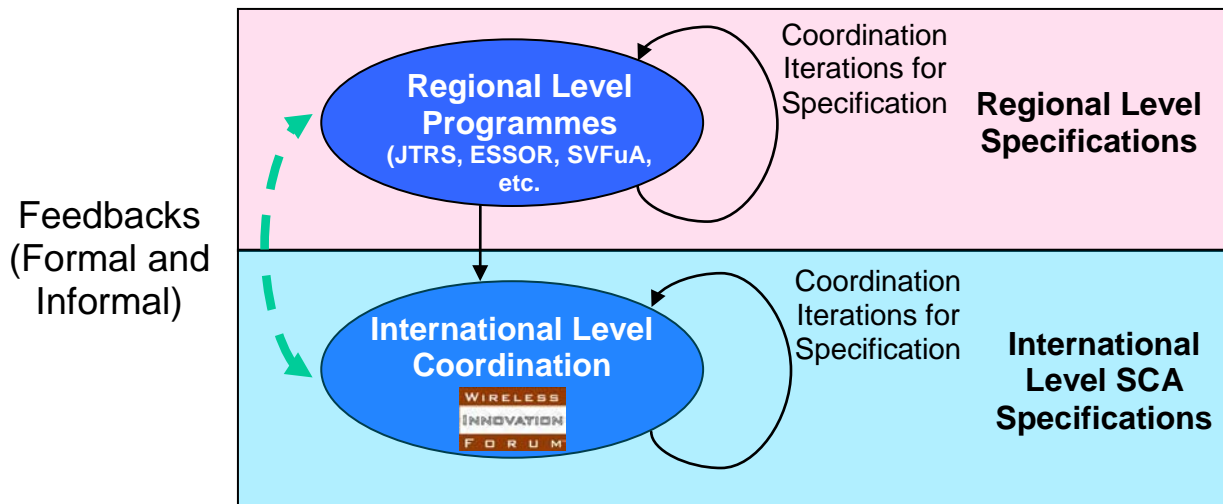


Figure 1: Coordination Body fosters technical collaboration between the various development organizations to harmonize SCA based specifications.

3.2 WinnF to serve as the Coordinating Body

Answering previous expectations requires the establishment of an international body where representatives from all relevant national and regional programs can participate to provide broader coordination for the evolution of the SCA specifications and world wide standards, in order to facilitate faster and less costly deployment of capabilities into the field. Such an organization should have an open collaboration model with well defined practices for document development, balloting and approval.

Based on its independent position in the international SDR community, combined with the collective interests and expertise of its membership, the Wireless Innovation Forum is the ideal place for such coordination to occur. The Forum’s Coordinating Committee on International SCA Standards (CC SCA) has global participation that is focused on initiatives intended to facilitate faster and less costly development and deployment of SCA based wireless communications capabilities worldwide.

3.3 WinnF organization for Coordination of International SCA Standards

3.3.1 Coordinating Committee for International SCA Standards

The WinnF has specifically created the Coordinating Committee for International SCA Standards to support the needs of improved coordination among International SCA Standards.

Like other committees of the Forum, the Coordinating Committee is member-driven with general participation in the CC SCA open to any member organization as per existing policy¹⁸.

¹⁸ Forum Policy 004

The Coordinating Committee is managed by a particular structure, the **Steering Group**, composed of a number of Forum member organizations that have been granted a large autonomy to help better serve the coordination needs of the SCA-based defense SDR ecosystem. Section 3.3.2 below provides details concerning the Steering Group.

The Steering Group coordinates with a particular structure, the **Advisory Council**, composed of representatives from government stakeholders that agree to work in close relationship with the Steering Group to orient the Committee activities in directions that serve the needs of international SCA standards coordination seen from the viewpoint of key governmental players. Section 3.3.3 below provides details concerning the Advisory Council.

The Committee is composed of a number of **Work Groups**, conducting technical activities related to specific projects of the Committee. Those activities relate to classical activities conducted by Forums such as the WInnF, e.g. certification, interpretation or profiling activities. Other activities relate to voluntary standards creation or international liaison in relation with procurement programs to support them in elaboration of some standards. Section 3.3.4 provides details concerning the work groups of the Committee.

The next figure graphically summarizes the structure of the Committee:

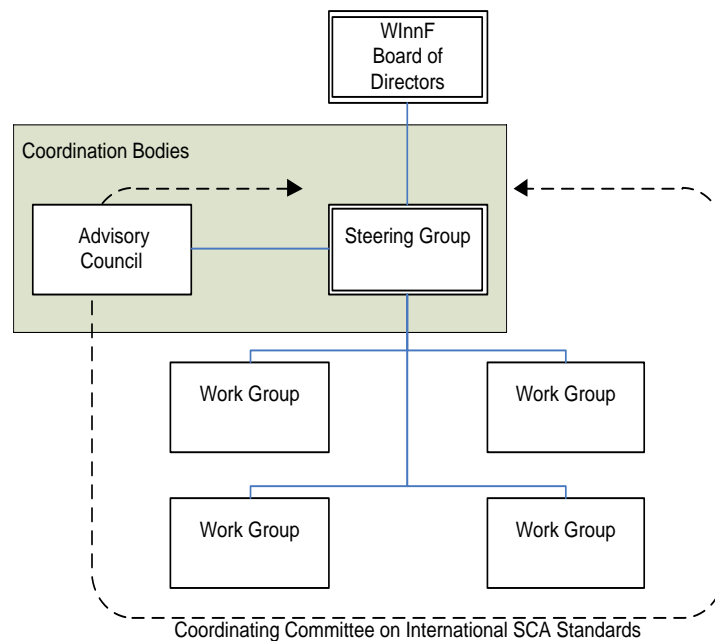


Figure 2: The Coordinating Committee on International SCA Standards.

3.3.2 Steering Group

The Steering Group of the CC SCA has the responsibility for coordinating the different activities within the CC SCA and ensuring that liaisons with the stakeholders and the Forum’s Officers and Directors are maintained.

SG membership is open to any WINNF member that agrees to pay an enhanced membership fee. The Forum's Technical Director is ex-officio member of the Committee's Steering Group, and represents the Coordinating Committee on the Forum's Board of Directors¹⁹.

The Steering Group has the following specific responsibilities identified for the sake of fulfilling the Committee Coordination objectives:

- Interfacing with external stakeholders, in particular the Advisory Council, as appropriate, to grow the influence of SCA standards and of the WINNF, and approving any communications out of the Committee,
- Defining, approving, publishing and maintaining roadmaps describing the evolution of SCA specifications to be proposed to become standards,
- Acting as the Project Approval Committee for the CC SCA, approving the activities proposed by the Working Groups²⁰,
- Managing the discretionary budget of the CC SCA and approving funding of special activities that would support the mandate of the Committee. This could include, if appropriate, working with Forum staff to contract out activities such as technical writing or reference implementations.

The Steering Group also undertakes the following responsibilities generally attached to chairs of other committees of the WINNF:

- Coordinating and monitoring the progress of the CC SCA Work Groups in accordance with the Approved Project and in compliance of the Work Groups with committee policies and procedures and recommending realignment if required,
- Overseeing the election process of the Work Group Chairs,
- Supporting the Forum's Document Approval Process, including acceptance of documents for committee ballot, coordination of document balloting at the committee level, and promotion of documents to the Forum Chair for Plenary level ballot²¹.

Daily management of the Steering Group is handled by an Executive Board elected by Steering Group members. Two possibilities exist for the chairmanship model: Chair plus Vice-chair or multiple Co-chairs. Secretary and Treasurer positions and at large members are identified.

3.3.3 *Advisory Council*

The Advisory Council acts as an advisory body to the Committee Steering Group.

The Council is composed of government and standardization stakeholders of defense SDR ecosystem external to the WINNF. Being a WINNF member **is not** a prerequisite to be member of the advisory council. Advisory Council membership is evolving under decisions taken by the SG in relation to the Advisory Council.

Members of the Advisory Council are individual persons affiliated with government stakeholder organizations that agree to participate under invitation to join from the Steering Group. Advisors

¹⁹ See section 7.3 of the 2010 to 2014 Strategic Plan

²⁰ In accordance with Forum Policy 002

²¹ Control Points 5 and 6 of the Forum's Document Approval Policy (Policy 001)

may be recommended by government stakeholder organizations to be considered for participation.

A separate charter is established for the Advisory Council and jointly approved with the Steering Group.

More specifically, the Advisors on the Council:

- Contribute in developing Work Products of the Steering Group by participating in Working Groups to issue comments and suggestions at any stage of elaboration of a Work Product (such as this document),
- Are consulted for comments on WINNF Project Proposals being submitted for approval to the Steering Group,
- Advise the Steering Group on stakeholder issues, needs, requirements, and directions;
- Provide thought leadership to the Steering Group in developing innovative concepts and strategic directions as appropriate to the governments needs;
- Encourage participation in the Committee by key wireless innovator leaders, as well as representatives from all levels of industry, associated organizations and individuals;
- Encourage and leverage openness of communication at all levels of the Forum.

Advice or recommendations are sought from the Advisory Council without attribution to any individual Advisors. The appropriate confidentiality of the discussions will be preserved.

The Advisory Council generally meets jointly with the Steering Group, on a regular or ad hoc basis by teleconference or face-to-face. Participation in Advisory Council activities and information exchanges will also be by electronic means utilizing the SDR Forum group portal (<http://groups.wirelessinnovation.org>).

Participation in the Advisory Council **grants no** voting rights for any Steering Group related activities. Only WINNF Member Organizations are provided specific voting rights.

3.3.4 *Technical Work Groups of the Committee*

The CC SCA has a number of Work Groups (WG) and Task Groups to help perform its mandate. A WG will have long term responsibilities and objectives while a TG will be more *ad hoc* responsibility for a specific project. A Task Group project may support multiple WGs when appropriate. WGs and Task Groups may be created or dissolved as needed, by the Steering Group of the CC SCA.

The current WGs of the WINNF at date of document approval are:

- SCA Next Work Group,
- SCA Implementers Work Group,
- SCA Application Programming Interface (API) Work Group,
- SCA Test and Evaluation Work Group.

3.4 Typical Coordination activities

This section presents a number of specifically identified activities that contribute to Coordination of International SCA Standards. The Steering Group in coordination with the Advisory Council are in charge of those Coordination activities.

Those activities are possibly undertaken as permanent missions or in the frame of dedicated projects to be approved and conducted in compliance with the WINNF's procedures.

The Advisory Council is closely associated with coordination activities in order to make sure that the works take to the largest possible extent the expectations expressed from Advisory Council members.

3.4.1 *Project approval for Coordinating Committee*

As one of its permanent activities, the Steering Group serves as Project Approval Committee for any project subject to take place within the Coordinating Committee.

From the WINNF process, the role of the Project Approval Committee consists in approving the launching of any particular WINNF Project, based on submitted Project Proposals. The Project Proposals, once approved, are promoted to Project Description status.

The opinion of the Advisory Council members will be sought in approbation of any Project Proposal addressing topics of interest for the Advisory Council.

3.4.2 *Reports on Status of International SCA Standards*

As one of its permanent activities, the Steering Group will prepare a periodic report addressing the status of International SCA Standards. To a large extent the content of § 2 of this document addresses the subjects that those reports will address.

A strong working relationship between the Steering Group and the Advisory Council is necessary to ensure the accuracy in the identified coordination issues. The Special Interest Groups of the Wireless Innovation Forum may also contribute to such reports.

The Advisory Council members will be directly involved in elaboration of these reports. The Steering Group will review and approve the report for publication per Wireless Innovation Forum procedures.

3.4.3 *Elaboration of Roadmaps*

The purpose of those activities would be to propose roadmaps on SCA-standards coordination, in order to enable decision making concerning coordination of SCA-based standards and specifications.

Preparation of specific projects proposals will be necessary for such projects to eventually happen because of the structuring impact preparation of jointly elaborated roadmaps could have

(e.g. in terms of launching of specific harmonization or standardization activities and eventually in terms of procurement requirements).

The opinion of the Advisory Council members will be essential in the preparation of such project proposals and in influencing the final approval of the projects.

Once launched, the elaboration of a given roadmap would require a close coordination between the Steering Group and the Advisory Council to ensure relevance of the outcome.

The validation as WinnF document would then happen following the usual balloting process across its members.

Figure 3 provides a notional vision of what a roadmap for Coordinated International SCA Standards. Note that this figure is provided for illustrative purposes only and does not represent actual SCA standards coordination data.

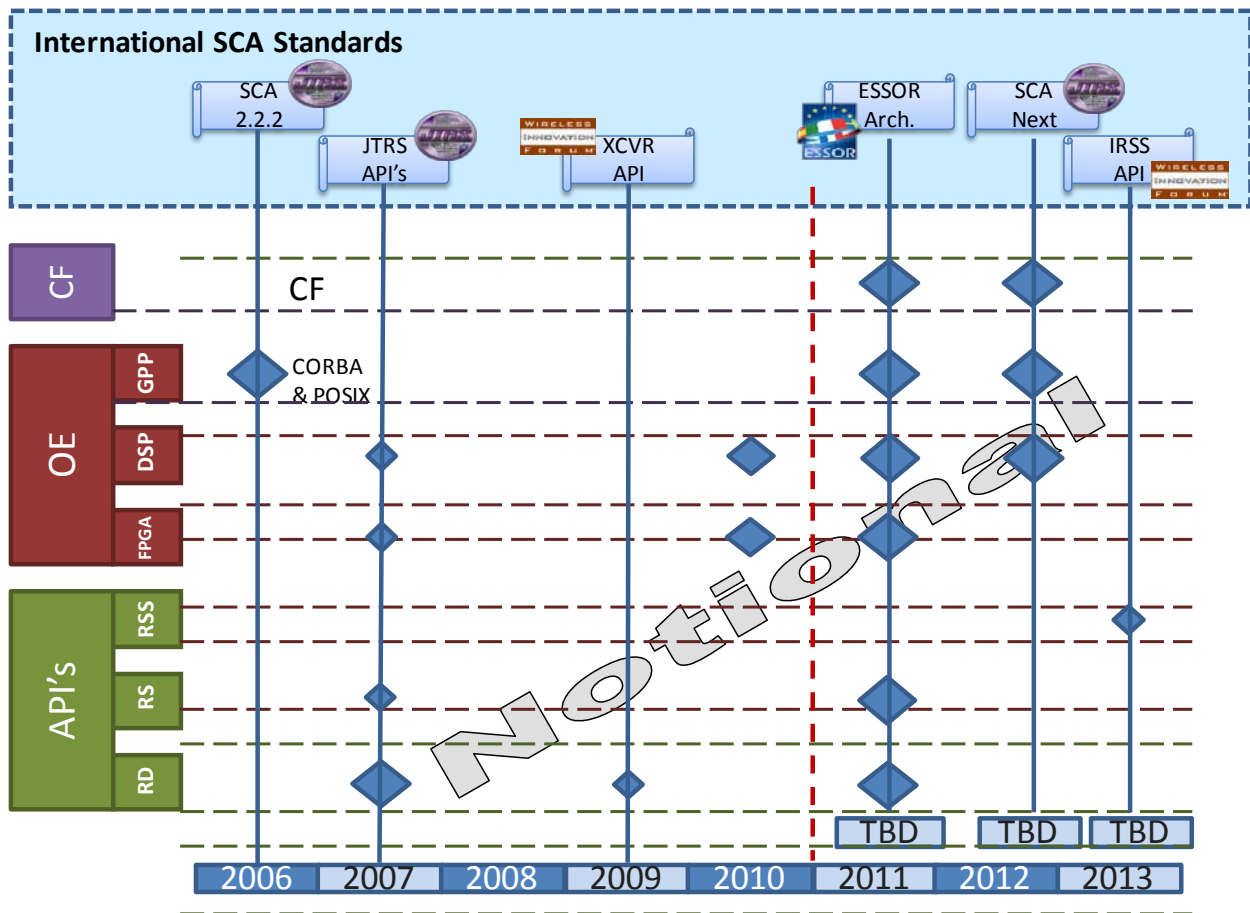


Figure 3: Notional view of roadmap for International SCA Standards coordination.

3.4.4 Initiating production of coordinated International SCA Standards

This activity occurs when any jointly agreed terms of reference for a broad support to specific standards Production are defined.

The supported standardization activities would need to take place within a specific working group of a particular SDO. They should be in line with existing, if any, roadmaps for coordination of International SCA Standards (see § 3.5.3).

The recommended activities would be influenced by many factors such as the standardization topic itself, its maturity, its level of endorsement or the level of divergence among existing specification addressing the topic.

Such recommendations will include sustained strategic discussions among the Steering Group and Advisory Council members to be in capacity to elaborate a working draft that could then be, when appropriate, balloted as a WinnF document by the WinnF membership.

The SDO identified could be a partner organization such as ETSI and the OMG, or the WinnF itself. When several SDOs are identified as potentially relevant for a given standardization activity, the following the defined process for the activity will ensure a fair evaluation before any direction is recommended.

4 Production of coordinated International SCA Standards

This section addresses the way **Production** of coordinated International SCA Standards happens in the frame of the proposed model. Production is one pillar of the proposed model that complements the Coordination aspects addressed in § 3.

While the main issues of Coordination are organizational, strategic discussions and recommendations disregarding any sort of Technical activities, **Production** activities focus on specific technical activities aimed at producing International SCA Standards.

4.1 Types of Production activities

The nature of the supported activities could be very diverse, and to a certain extent difficult to exhaustively predict and describe at this stage of this report.

A number of possible types of standardization activities can nevertheless be identified as described in this section. These terminologies enable characterization within this report as to what a number of current activities are about, and are proposed as a contribution to facilitate later elaboration concerning what future standardization activities could be.

4.1.1 Open custodianship

When a standardization topic is identified as missing and deserving to be covered by specific elaboration effort within a SDO identified as being the most relevant for such elaboration activity, *creation* activities correspond to the activities corresponding to first elaboration of the considered standard.

Existing examples are numerous. One can quote the OMG CORBA specifications, the WINNF Transceiver Facility (see § 4.3.2) and International Radio Security Services (IRSS) (see § 4.3.3).

4.1.2 International liaison

When a standardization topic is under development by a given procurement program that aims to communicate on its achievements and collect contributions concerning the way its work in progress should finally evolve. The program establishing an international liaison activity retains full decision power concerning final evolution of the specification.

An existing example of International Liaison is the work realized by the WINNF SCA Next Work Group that serves as international liaison for elaboration of JTRS SCA Next (see § 4.3.1).

4.1.3 Ratification

For any standardization topic covered by a single largely supported specification, *ratification* is performed to allow the specification to be introduced to a regional / international SDO for escalation to the status of normative standard while avoiding, to the greatest extent possible, modifications that would jeopardize backward compatibility of the standard with the initial specification. A **Coordination** role is important in the Ratification stage due to the possible

involvement of participants of the specific SDO not familiar with the original specification, or the involvement of multiple SDOs in related activities. During the Ratification stage, Coordination implies working to harmonize the set of SCA Standards to ensure their technical/mutual consistency.

The Wireless Innovation Forum advocates for itself the right of being endorsed as reference technical organization, providing recognized subject matter technical expertise in order to safeguard the job of the production phase. For doing that, WinnF will operate, at a certain extent, by centralizing the discussions on the technical issues appearing during Ratification Phase in its own competencies and methodologies.

The practical means for facilitating this process is illustrated in Figure 5. Feedbacks are depicted in the picture as a green dashed line with bi-directional arrows. Feedback may be formal, through membership by the WinnF in the SDO or through a well defined collaborative agreement between the SDO and the WinnF, or informal through mutual members of both the SDO and the WinnF. It is recognized that while discussions for ratification are in progress in the specific SDO, obstacles to the ratification may be encountered, and so these feedback mechanisms are important to bring the issues identified back to the WinnF for discussion to define appropriate actions for advancing the ratification process in a manner that is beneficial to the members of the SDO, the members of the WinnF, and the SCA community as a whole.

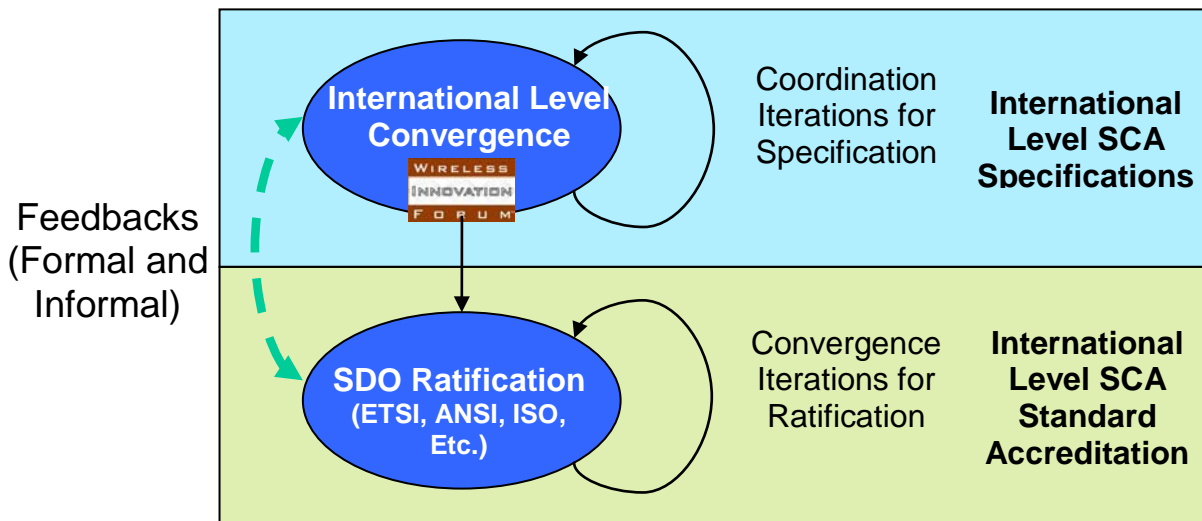


Figure 4: Process Model view for contribution, elaboration and ratification.

One possible way to facilitate such feedback is to appoint a WinnF representative (officer or member) as technical lead of the standardization effort in the SDO. In this way, the Wireless Innovation Forum affords its competence and fast response attitude to propel the growth of the SDR system. Members of National and/or International SDR Programs Management Organizations can also influence the effort by either attending WinnF sessions or by direct contribution to the SDO.

4.1.4 Harmonization

When a standardization topic is addressed by at least two different specifications, that are overlapping and completing each other in a more or less coherent fashion, *harmonization* consists of accurately evaluating the differences and proposing resolutions that enable emergence of a new specification that leverages to the maximum extent the value of the entry specifications.

4.2 WinnF and Production of coordinated International SCA Standards

Besides its role as Coordinating Body for International SCA Standards and its position of reference Forum with regards to SCA Standards, the WinnF can host a number of working groups activities for standards elaboration as such.

4.2.1 SCA Next Working Group

The **SCA Next Working Group** is hosted by the WinnF Coordinating Committee on International SCA Standards.

It works with the SCA international stakeholders to evolve the SCA base specification to facilitate the development of radios and increase their performance.

It currently acts as international liaison for JTRS JPEO for elaboration of SCA Next. Strictly speaking this is not a Custodian role since the decisions remains under sole JPEO responsibility. It is nevertheless a significant influence capability to those participating to the review and comment effort.

This corresponds to an **International Liaison** role as identified in § 4.1.2.

4.2.2 Transceiver Facility Working Group

The **Transceiver Facility Work Group** is hosted by the WinnF Technical Committee on Next Generation Radio Technologies Technical Committee.

The Transceiver Facility V1 was released in January 2009.

This specification has served in a number of European R&T projects (EULER, CREW), and has been reported by ESSOR to serve as a basis for definition of the Transceiver API of the ESSOR Architecture. ESSOR Industries reported in October 2010 the intention to contribute to elaboration of Transceiver Facility V2.

This corresponds to an **Open Custodianship** role as identified in § 4.1.1.

4.2.3 International Radio Security Services API

The **International Radio Security Services API** Task Group is hosted by the Security WG of the WinnF Technical Committee on Next Generation Radio Technologies.

The group is developing a technical specification for use by nations, international organizations and companies who need software interoperability and portability between international and independently developed software radios. The resulting “International Radio Security Services API” will specify how to interface and operate with a common set of radio security services, thus improving interoperability and portability of software through the use of a common open software architecture.

This corresponds to an **Open Custodianship** role as identified in § 4.1.1.

4.2.4 *Smart Antenna WG*

This working group issued the Smart Antenna API specification in close collaboration with the OMG. § 4.3.2 provides details in a chapter dedicated to OMG as a producer of coordinated International SCA Standards.

This corresponds to an **Open Custodianship** role as identified in § 4.1.1.

4.3 Partner SDO and Production of coordinated International Standards

This section identifies the Standard Development Organizations (SDO) that have partnered and/or been in position to partner with the WINNF to host a number of production activities of coordinated International SCA Standards.

4.3.1 ETSI

The European Telecommunications Standards Institute ("ETSI") is an industry-led standards development organization with a membership of over 700 manufacturers, network operators, service providers, research bodies, regulatory bodies and academia from over 50 countries. ETSI undertakes pre-standardization and standardization activities in areas common to telecommunications, information technology, sound and television broadcasting. ETSI aims to produce globally applicable standards and is the recognized European Standardization Organization for telecommunications.

The Wireless Innovation Forum has a Memorandum of Understanding allowing collaboration with the ETSI Technical Committee on Reconfigurable Radio Systems (TC RRS)²².

ETSI is in particular being considered to play a role from the **Ratification** perspective as exposed in § 4.1.3.

4.3.2 OMG

The Object Management Group™ (OMG™) is an international, open membership, not-for-profit computer industry standards consortium. OMG member companies write, adopt, and maintain its standards following a mature, open process. OMG's standards include: Model Driven Architecture®, Unified Modeling Language™, and CORBA®.

The Wireless Innovation Forum is a member of the OMG and has made the OMG a Wireless Innovation Forum member to simplify collaboration between the two groups.

OMG is therefore playing a role from an **Open Custodianship** perspective as exposed in § 4.1.1.

²² <http://data.memberclicks.com/site/sdf/ETSI-WINNF%20MoU.pdf>

In addition to the OMG-produced standards mentioned above, WinnF and OMG have jointly released in 2009 the standard “PIM and PSM for Smart Antenna Standard”²³, through the original collaborative development model depicted in the following figure:

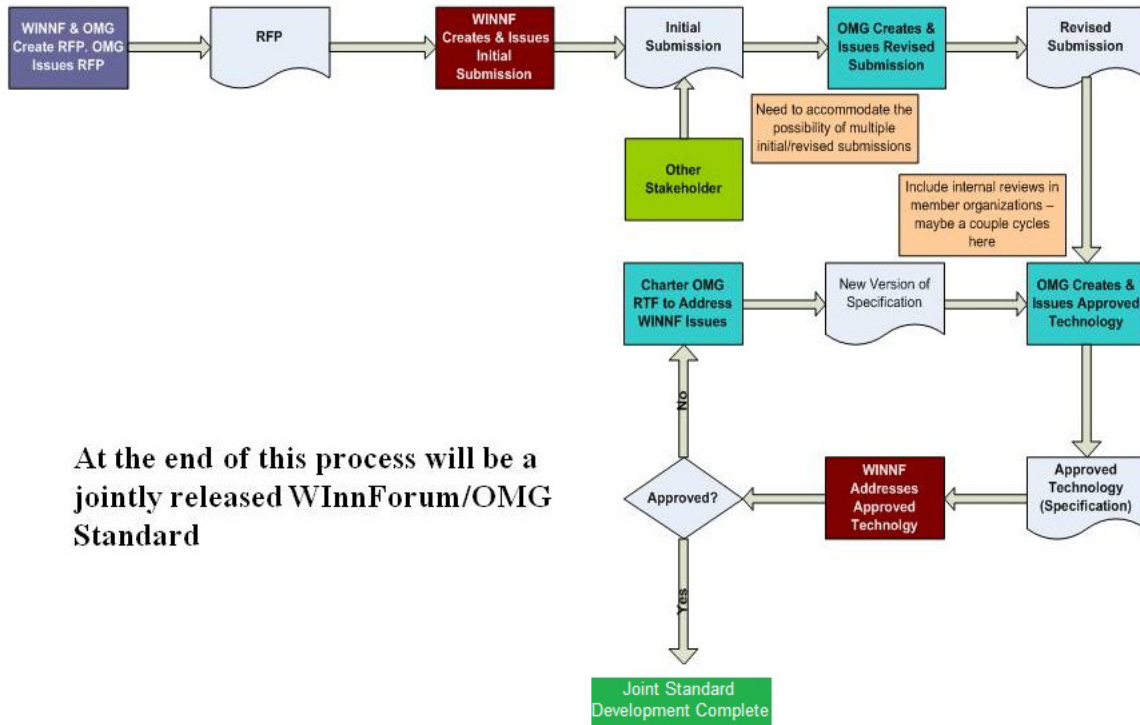


Figure 5: Joint OMG and WINNF standard development model.

²³ <http://groups.winnforum.org/d/do/1555>

5 Support to coordinated International SCA Standards

This section summarizes the activities of WinnF that support usage of International SCA Standards to the largest extent. All are undertaken by working groups of the Coordinating Committee, and they correspond to classical activities of a Forum organization

Having the Coordinating Committee hosting these activities in complement to the Coordination and Production activities is seen as an important factor of optimization in a joint understanding by all SDR eco-system stakeholders of the current situation and associated issues and perspectives.

Beyond already existing working groups, potential additional activities, under consideration at the time this report was prepared, are as well provided. Figure 6 provides a representative view of the types **Support** activities which will be necessary to accommodate a coordinated SCA Standards ecosystem.

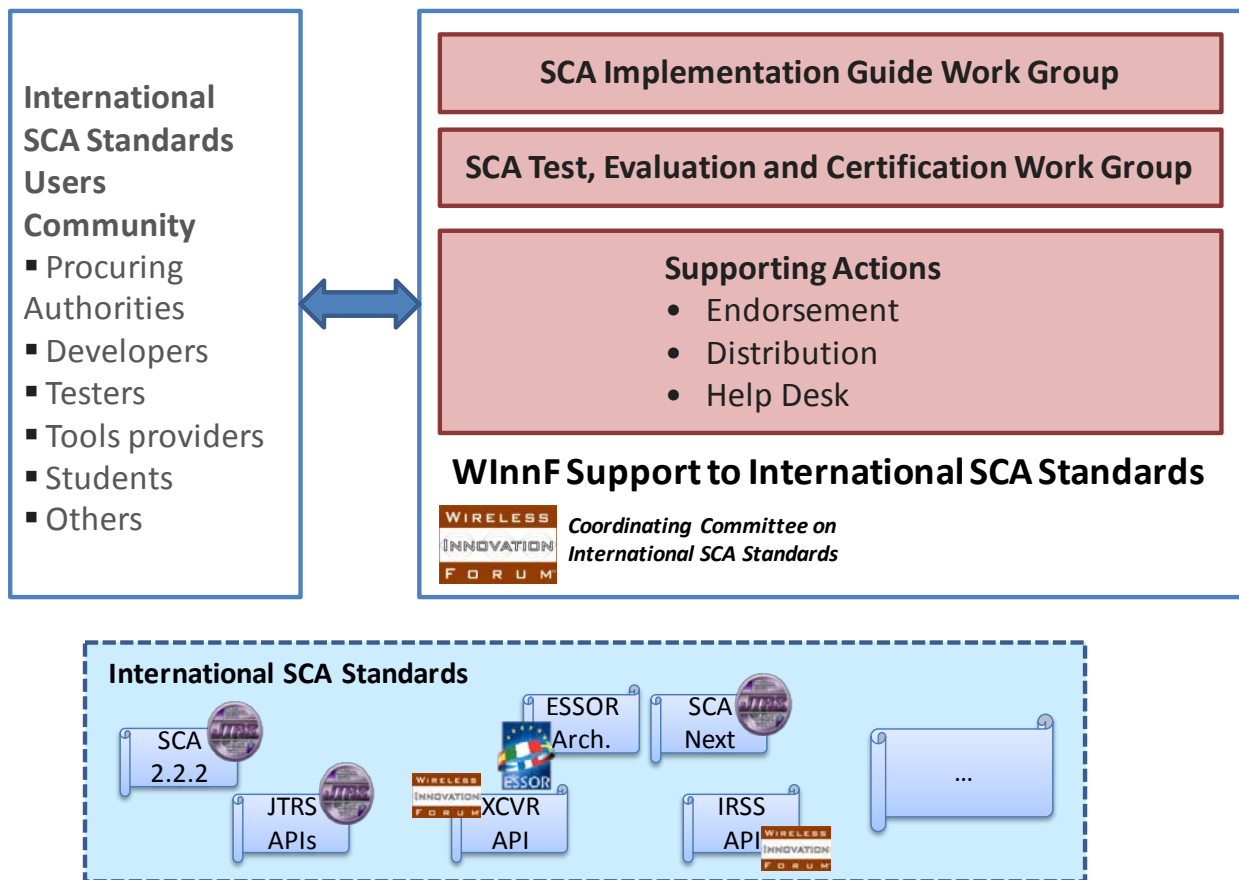


Figure 6: WinnF support activities to International SCA Standards.

5.1 Working Groups of the Coordinating Committee

5.1.1 SCA Implementers Work Group

This Work Group reviews the SCA base specification and will ensure that a common understanding of the clauses within the standard can be obtained. Current projects include the development of the "*Software Communications Architecture Users Guide*". This report is being prepared for the participants in the international software defined radio community where the SCA and SCA derivatives are of relevant who need clarity on the SCA to harmonize the development of embedded system software in order to lower development and maintenance cost as well as time to market.

5.1.2 SCA Test, Evaluation and Certification (T&E) Work Group

This Work Group will develop a process by which SCA based radios can be tested and certified. The group's current project is entitled "*SCA Certification Guide #2 - SCA Test, Evaluation and Certification Model Realization*". This Recommendation is being developed for procurement authorities, producers of radios, radio components and tools who are active in markets where the standardized SCA is relevant and compliance is required to provide guidance on establishing test and certification capabilities for "category 1" standards to ensure that compliance is met in an efficient way including time to market and cost.

The Recommendation will aim to define the realization aspects (including business models) of the role based, generic certification process of SCA based SDRs, as defined in the Report "Test and Certification Guide for SDRs based on SCA Part 1: SCA" and will define and analyze candidate approaches and give recommendations to satisfy the responsibilities of the roles identified in that document.

5.2 Supporting Actions from the Coordinating Committee

This chapter describes supporting actions from the Coordinating Committee that add to those undertaken by the Working Groups. They may be undertaken at committee level or within one of its working group.

They can be driven by membership or be undertaken by Forum's staff under Steering Group's guidance.

5.2.1 Endorsement of International SCA Standards

The Coordinating Committee can evaluate existing standards for endorsement as preferred standards following the Forum's standard open process²⁴. These evaluations would happen in the scope of dedicated projects of the Steering Group in relation with the Advisory Council.

The outcome would typically be endorsement reports such as the one released in 2008 for the endorsement of the SCA 2.2.2 specification²⁵.

²⁴ http://www.wirelessinnovation.org/page/Document_Approval_Process

²⁵ <http://groups.winnforum.org/d/do/1576>

5.2.2 *Distribution of International SCA Standards*

The Coordinating Committee is managing a portal on the WInnF web site that distributes International SCA Specifications under terms agreed with standard developing stakeholders (Programs, third SDOs, WInnF as a SDO)²⁶.

Specifications distributed in that fashion, not precluding existence of dedicated distribution means such as web sites managed by the originators of the provided specification, are seen as the set of specifications that coordination of international SCA Standards is all about.

The WInnF is already undertaking this activity in agreement with JTRS JPEO for the SCA-based specifications published by JTRS.

5.2.3 *Help desk*

This activity is under creation, following the idea that the role of the SCA Implementers Work Group can be expanded to produce implementation guides defining best practices and to "crowd source" providing a "help desk" function to the broader community.

²⁶ http://www.wirelessinnovation.org/page/SCA_Standards

6 Conclusion

This report provides a Model for Coordination of International SCA Standards organized around the Wireless Innovation Forum Coordinating Committee on International SCA Standards, structured according to three mainstream axes: Coordination of International SCA Standards as such, Production of coordinated International SCA Standards and support for the overall SCA Standards eco-system

Coordination activities rely on close working relations between the Steering Group and the Advisory Council of the Coordinating Committee, and one essential aspect for efficiency of this coordination will be to achieve a large representations from government stakeholders in the Advisory Council, since they represent for a number of them key contributors to international SCA Standards, while most of them are in position to procure in more or less near terms SDR products based in coordinated International SCA Standards.

Production of coordinated international SCA Standards is subject to adopt many forms, within a partner SDO or within the WINNF itself. While classical standards custodianship is likely to take a part, international liaison with some acquisition programs and harmonization activities among a number of existing standards and specifications are subject to a significant amount of interest. Ultimately, ratification towards flagship partner SDO of a harmonized suite of SDR standards represents the longest term perspective to which this model aspires.

Support to coordinated International SCA Standards is therefore likely to increase thanks to additional activities being undertaken by the WINNF as an association of key SDR stakeholders from industry and governments.

It is therefore the hope of the Wireless Innovation Forum that this model sets the basis for a flexible and efficient coordination model capable of preparing decisions and activities for emergence of a suite of coordinated International SCA Standards, considered as one essential objective to be fulfilled for the benefit and efficiency of the SCA-based eco-system.

7 Annexe A - Articulation with WinnF Standards Collaboration Model

This chapter explains how the coordination model presented in this document complies with the WinnF Standards collaboration Model.

7.1 WinnF Strategy regarding standards

The strategic plan of the WinnF describes the driving approach of WinnF with regards to standards development²⁷.

The related strategy is exposed under the following terms:

- **First, the Members will ENDORSE 3rd party “standards” when possible.** Endorsements will occur under relevant licensing terms to allow the Forum’s members to leverage the work of other organizations to the greatest extent possible in supporting their specific needs.
- **The Members will PROFILE existing 3rd party “standards” when necessary.** As standards often incorporate a host of features and requirements that may not be relevant to the Forum’s members in their entirety, the Forum will extract a subset of specifications under the appropriate licensing that are relevant to our Members’ needs.
- **The Members will INFLUENCE other standards bodies as appropriate to support our member’s needs.** This strategy establishes the Forum and its members as a customer for these organizations, allowing the Forum’s members to focus on requirements, use cases, and business models and coordinate as necessary across multiple standards bodies.
- **The Members will DEVELOP their own specifications and standards when necessary.** The first choice of the Forum’s members in this instance will be to modify or extend an existing standard if possible, but the Forum realizes it may need to develop its own specifications and standards to address the needs of its member organizations. As such, the Forum will retain its registration as a standards development organization (SDO) and will work to mature its standards development processes to fully meet with the needs of its members.

²⁷ http://data.memberclicks.com/site/sdf/SDR_Forum_2010_to_2014_Strat_Plan.pdf

The approach is summarized in the following figure of the strategic plan:

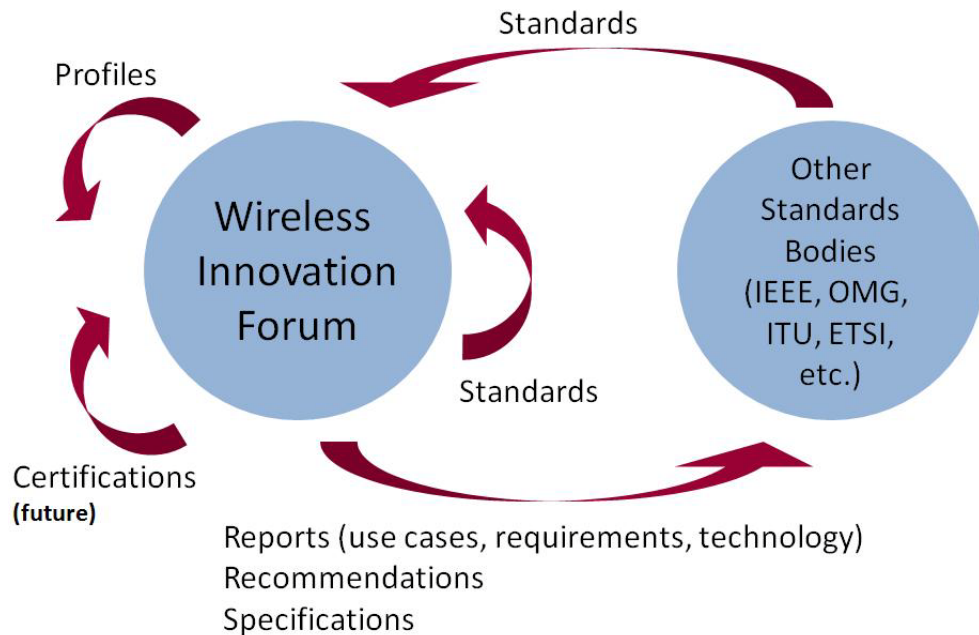


Figure 7: The Forum's Standards Collaboration Models.

7.2 Articulation

The model proposed in this document leverages the strategy recalled in the previous section in a number of areas.

The **Endorsement** dimension of the strategic plan is specifically covered by the Endorsement activity as described in § 5.2.1, that could be expanded when needed to a **Profiling** dimension.

This said, the **Influence** dimension of the strategic plan is the one that the model for coordination is most significantly contributing to, since the Coordination activities undertaken by the Steering Group and the Advisory Council aim to influence the future of international SCA standardization.

The **Development** dimension of the strategic plan is addressed through the activities referenced in this document where the WINNF undertakes Open Custodianship of a number of standards (§ 4.2.2 Transceiver Facility and § 4.2.3 International Radio Security Services) and serves as Public Liaison for elaboration of SCA Next as described in § 4.2.1.

8 Annexe B – The WinnF Document Development Process

What follows is an excerpt from Section of the Forum’s Document Development Process. The complete process can be found at:

[http://www.wirelessinnovation.org/page/Document Approval Process](http://www.wirelessinnovation.org/page/Document%20Approval%20Process)

The Documents Approval Process applies both to Documents that are intended for release to the public by the Forum and also those documents that are not intended for release to the public. At each stage in the maturation process, referred to as a control point, the document proceeds through an evolutionary cycle.

There are six major goals for the process:

- Formalize the mechanism by which any member can propose an item for endorsement by the SDR Forum and release to the SDR marketplace at large.
- Provide an opportunity for any member having a stake in the content of an item to influence the positions taken before it is formally adopted by the SDR Forum.
- Provide a way to identify the current status of a work item and the work plan for further maturation.
- Identify the originator of an item, define the role of any other parties with a degree of sponsorship, and indicate the “Work Group” that has sponsorship of the item (document). And as such, the Chair of the Sponsoring “Work Group” has management responsibility for maturation of the item (document).
- Provide an archival record of the process through which an item matures. This will include all versions of the item, the comments on each, responses to the comments, and the dates on which all actions on the item took place.
- Provide a framework so that different sizes of task groups may develop documents (single person to large groups). And provide a framework so that work groups can develop different documents based on the objectives of the particular committee they represent; thus market reports, regulatory comments/reviews, concepts of operation, technical architectures, etc. could be developed under this documents approval process. This freedom of development of documents can be applied to ad hoc committees and to existing or new Forum committees; and the document approval process is applicable to all Forum documents.

The process is summarized in Figure 7. There are a series of maturity levels, defined at the present from Draft Submission through Release. At each level there are defined phases, from admission to balloting, which must be accomplished. They will normally be done sequentially, but may be taken out of sequence if circumstances indicate.

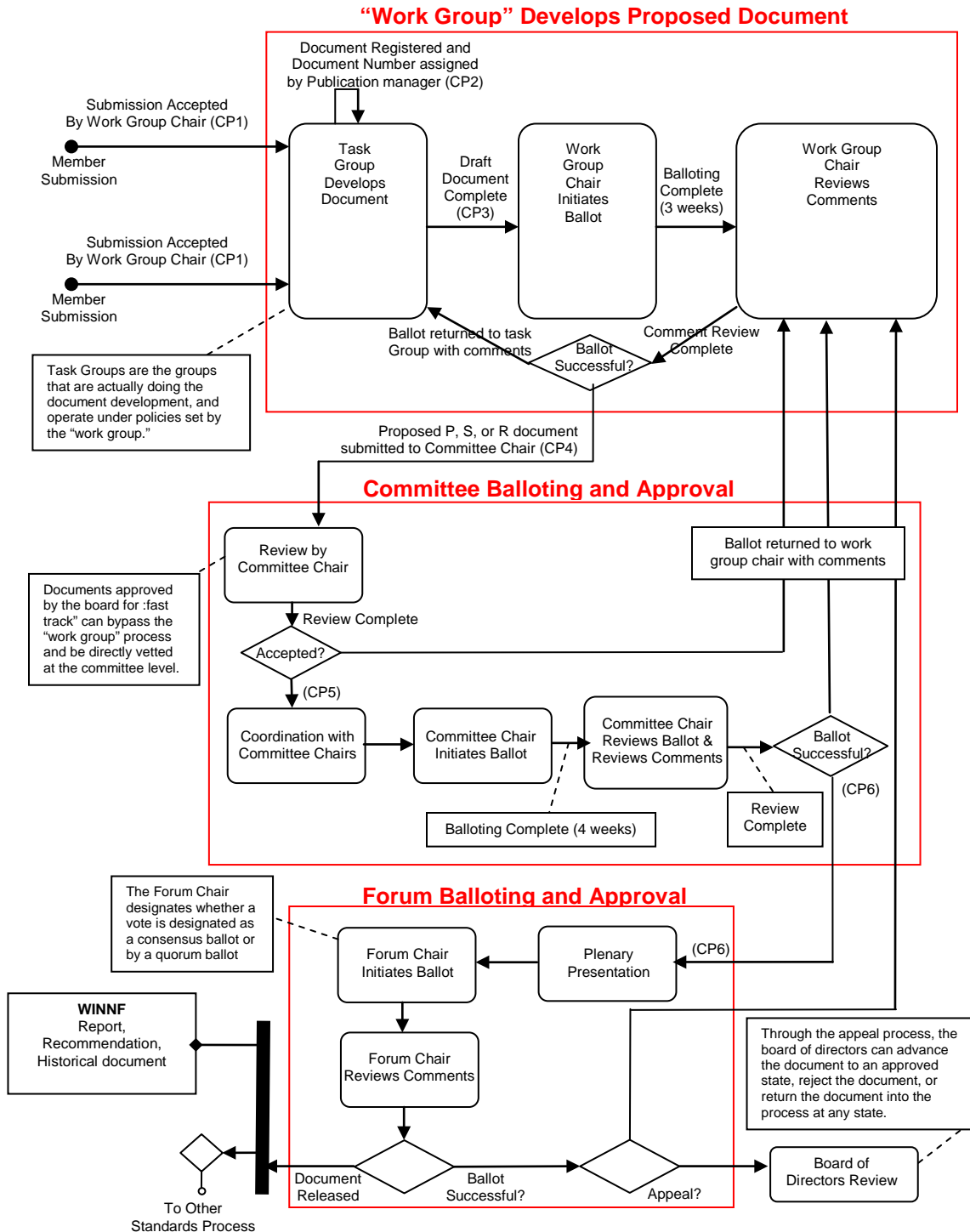


Figure 8: Activity Diagram of the SDR Forum Document Release Process.

8.1 Document Levels of Maturity

Documents are generally developed within the Forum as a part of a work project that has been approved by the Forum's Project Approval Committee, as defined in the SDR Forum Project Approval Process ([SDR Forum Policy 002](#)).

The Stages along the Document Approval Track are described in following sections.

8.1.1 *Submission*

The document is developed by a Forum member organization and submitted to the Forum for consideration and promotion. Documents developed within the "working group" may skip this phase, and documents submitted for information purposes only ("I" documents) are never promoted beyond this phase.

8.1.2 *Draft*

Document Submissions have been accepted, the project to mature the document has been approved, the format of the document (Report, Specification, Recommendation) has been defined, the document has been developed by a Sponsoring "Work Group".

8.1.3 *Proposal*

The document developed by the Sponsoring "Work Group" has been balloted at the Sponsoring "Work Group" level, and has obtained the Sponsoring "Work Group" Approval. The document is submitted to the appropriate Committee.

8.1.4 *Release*

Documents has been accepted by the Committee chair, balloted and approved at the Committee level, and accepted for publication by vote of the eligible SDR Forum membership. After this approval, the document is promoted to an SDR Forum Released Document, with the appropriate designation.

8.1.5 *Standard*

The document is designated as a voluntary standard that is ready for the SDRF Standardization Process. It may be submitted to another recognized Standards body or published by WINNF.

8.2 Comments

During the process of deliberation on a document under consideration there are normally a number of changes of language. Prior to balloting at the Committee level, these changes may be entered as markup in the primary document using a "track changes" function of the document editing tool or they may be submitted separately. The document champion may convert to a new version number as appropriate. The comments/proposed changes are gradually worked off to arrive at a document that has consensus from the "work group." In order to retrieve earlier

comments, they are stored by the document champion because he has stored earlier versions of the document.

When comments are developed for a document that has not been approved for public release, the comments may be limited to “working group” members and Forum members.

During balloting to promote a document from Proposal to Release, a separate set of comments will be collected by the Publications Manager. These comments will clearly define what portion of the base document is to be changed and should suggested substitute language. The convenience of the document editor should be considered by making insertion of the new material into the existing document as simple as possible.

8.3 Document Approval Phases:

The following Phases are used at each Level of Maturity within the process.

8.3.1 Admission

Admission is the step where a document is accepted for work effort to mature it to a higher maturity level. As part of this phase the Sponsoring “Working Group” chair with reporting responsibility is identified.

8.3.2 Development/Coordination

In this phase detailed consideration of the document is made. Changes may be made by the originator, or submitted as comments by others. This phase may take an extended period of time if a large number of revisions are proposed, or it can be executed very quickly if there is consensus that the criteria for promotion have been met.

8.3.3 Proposal for Promotion

For each level of maturity, a sponsored “working group” level is specified. When that “working group” is satisfied with the work effort, they prepare to submit it to the next higher stage (stages shown in section 8.1) with a Proposal for Promotion. The submitting working group chair collaborates with the receiving level Chair (Technical, Marketing, Regulatory, etc.) to bring the document up for consideration. It is incumbent on those involved to “socialize” the proposal with Forum members at appropriate levels to identify any unresolved issues prior to submittal.

8.3.4 Last Call

Prior to promotion there is a time period when the document is made available for consideration. The Sponsoring Chair controls the Last Call process, and Last Call may be concurrent with Balloting.

Comments received during Last Call must be evaluated by the Sponsoring Chair, and two options are possible:

- 1) If only minor changes and typographical edits are received, these may be made on the fly. The document can then be promoted without requiring recirculation.
- 2) If substantive comments are submitted, and the Sponsoring Chair determines that these comments must be resolved before the Proposal for Promotion is accepted, then the document must be returned to the “work group” for resolution of the comments. Once the comments are resolved, the process repeats until the Proposal for Promotion is accepted.

8.3.5 *Balloting*

Balloting requirements are specified for each Stage. **Balloting at all stages is limited to Forum Members only.** Eligibility for balloting at the work group level or below will be set by the approved work group policy, and may be limited to only active work group members. For balloting at the Committee or Plenary level, each eligible Forum member organization casts a single vote following the procedures defined herein. If several representatives from a member organization are present, they may caucus to determine their organization’s vote.

8.4 **Protests and Appeals**

This entire process is intended to strengthen and expedite the work of the Forum. It is subject to review by the Board of Directors. They may revisit any decision made under the process, or revise the process.

Disapproval of a document can be appealed to the Forum Board of Directors. Protests relating either to approval or disapproval of a document are adjudicated by the Forum Board of Directors, and their decision will be final. If they so choose, they may reinstate any document into the standards process at the level they choose, and with whatever comments they choose, for reconsideration.

8.5 **Joint Development with Other Organizations**

Through our liaison activity, the Forum may be involved with the document development process of other organizations. In this case, three scenarios are envisioned:

- 1) The Forum develops a formal input to the other organization as a member of that organization. This input would need to follow the process for creating an approved document outlined in this process,
- 2) The partner organization provides input to the Forum as a member. In this case, the document will be assigned an information document number and will be treated under the rules of membership. This will likely mean the document will be protected as “SDR Forum Members Only”,
- 3) The Forum may jointly develop a document at the working level with the other organization that will be jointly released, in whole or in part, by the 2 organizations.

In the latter case, the memorandum of understanding between the two working groups should clearly align the processes to be followed by the two organizations. At a minimum, the process should allow for multiple drafts of the document to be jointly developed between the two

working groups without formal balloting by either group. Once the joint document is stable, the document should be balloted through both organizations following their respective processes. Should comments occur during the balloting at any stage by either organization that could materially affect the balloting of the other organization, a mechanism must be provided to allow for this feedback.