SCA 4.1 OVERVIEW HIGHER BENEFITS FOR SDR STAKEHOLDERS

SCA 4.1 Draft Release

WinnComm 2015

SCA : Global Adoption, Proven Performance

Global Adoption, Proven Performance

Drivers of SDR Adoption

- Enhanced communications interoperability
  - Common waveform application base across multinational coalitions
- Simplified insertion of new communications capabilities in deployed radios
  - E.g. next generation MANET, dynamic spectrum allocation…

Benefits of SCA Adoption

- Proven cost and delivery time advantages
  - Reuse of waveform application software
  - Within a radio family and across radio vendors
- Reduced development risk and time-to-market
  - Established ecosystem of SCA vendors

SCA standard evolutions for benefits for the Value Chain

Proven Performance in Deployed Systems

Status of deliveries for US Market

- First Generation: NB capabilities: 350,000+
  - Mainly AN/PRC-152 and AN/PRC148 product familie
- Second Generation: WB capabilities: 80 000+
  - AN/ PRC-154 and AN/PRC-155: Near 25000
  - AN/PRC-117G and AN/PRC-152A product families : Near 55000

Status of SDR Platforms and SDR Waveforms

- Near 40 Waveforms developed and ported in US and International Markets
  - More than 50% are actively developed or deployed into forces
- More than 40 Platforms identified in US and International markets
  - 15 international vendors proposing , developing and deploying SDR platforms including SCA capabilities to support Multi-Waveforms

A Rich and Evolving Ecosystem

SCA 4.1 Overview & Benefits

SCA 4.1 Introduction

After successful introduction of SCA 2.2.2, largely deployed and used in US and International markets

SCA 4.1 incorporates new technology advances to enhance

- Waveform Interoperability
- Waveform Portability
- Information Assurance
- Affordability

While preserving investments in SCA 2.2.2 Waveform Applications, SCA 4.1 introduces key benefits for all SCA Value chain stakeholders

SCA 4.1 Highlights

1. **Support Wide variety of SDR Platforms type**
   - Better Applicability for dismounted & lower cost platforms ; Longer Battery Life
   - Improve architectural scalability to address the size, weight, power and cost requirements
     - Profiling and architecture improvements
   - Improved support for devices such as DSPs and FPGAs
2. **Enhance Information Assurance**
3. **Performance improvements**
   - Start Up time Enhancements : Boot & WF deployment
   - Improved realtime performance
4. **Reduce Development Lifecycle costs**
   - Testing cost Enhancements
   - Requirements cleanup
5. **WF Portability Enhancements**
6. **Easy Introduction with Backwards Compatibility features**
   - SCA 4.1 protects SCA 2.2.2 Waveform Application Investment

SCA 4.1 provides real benefits to warfighter, radio vendors and the complete SDR ecosystem

SCA Benefits for SDR Value Chain

- Interoperability
- Support Wide variety of SDR Platforms type
- Information Assurance
- Performances

- WF Portability
- Diversity & Flexibility in procurement options
- SDR Market Place

- Development Lifecycle
- WF Portability
- TTM

- Larger application for standard

SCA 4.1 Preview Event - Testimonials

SCA 4.1 Promising Future

SCA 4.1 Standard Preview Workshop
9-10 October 2014 ~ Aberdeen, Maryland
hosted by
MITRE
held in cooperation with JTNC

WIRELESS INNOVATION FORUM

***Aeroflex** : SCA 4.1 –it's not just for tactical radio...*

PRISMTECH

***DGA** is investigating the potential for SCA4.1 for its French SDR roadmap*

DGA

***ESSOR** Community congratulates the joint multinational efforts performed in the framework of the WINNF SCA 4.1 WGs, integrating positively significant contributions provided by ESSOR.*

a4ESSOR

***Fraunhoffer** : The new SCA 4.1 provides a crucial edge over SCA 2.2.2*

Fraunhofer FKIE

***Harris** : SCA 4.1 will be a useable specification*
SCA 4.1 is essential for a broad commercial adoption

AEROFLEX

***NordiaSoft** already has implemented many features that are now present in SCA 4.1*

HARRIS

***PrismTech** anticipates that SCA 4.1 enhancements will help to accelerate the adoption of SCA going forward,*

NordiaSoft

***Reservoir Labs** anticipates continuing to support the evolution of the SCA with an upgrade of R-Check SCA for SCA 4.1 in 2015*

Reservoir Labs

***Thales** is highly interested by SCA 4.1, and has actively contributed to its development ; Thales is positive regarding adoption of SCA 4.1 Core Spec"*

THALES

SCA 4.1 Overview & Benefits

1 Reduce Radio Size and Cost

Different Platforms – Different Profiles
Decreasing SWAP, Cost & Complexity

Introducing Profiles

- SCA Lightweight Profile
  - Suited for radio platforms where the hardware modules have a static configuration.
  - Provides a minimum set of functionality which is applicable for resource (e.g. SWAP) constrained platforms.
- SCA Medium Profile
  - Suited for radio platforms with plug-and-play but not removable hardware modules.
  - Still rather lightweight but it introduces a configurable, dynamic aspect.
  - The most flexible platform in that it provides the lightest weight implementation that supports the legacy SCA deployment model.
- SCA Full Profile
  - Suited for radio platforms with removable, plug-and-play hardware modules.
  - Provides the full breadth of SCA deployment and management capabilities
  - Aligned to support prime power, multi-channel sets

SCA 4.1 allows vendors to select which features are supported to meet their program's mission without impacting portability or interoperability

1 Reduce Radio Size and Cost

Component scalability

- Allow component developers to choose whether or not to implement some of the standard sub-component interface. The scalability will also be used to support the different profiles of the specification.

Scalability of the manager components

- Allow developers to choose whether or not to implement all of the manager interfaces. The manager scalability will also be used to support the different profiles of the specification

Minimal ultra-Lightweight AEP definition

- Provides minimal uLw specification with optional grouping to extend capability

Remove requirement for CORBA middleware

- SCA 4.0 permits other middleware, including simply using C++ pointers where distributed processing is not required.

SCA 4.1 allows vendors to 'right size' the radio to the mission

Resource Constrained Processors

Component Scalability

- SCAv4.0 introduced component scalability
  - Supports components of smaller sizes but uses "conditional inheritance" which is not UML compliant
- SCAv4.1 revisited component scalability
  - Replaced conditional inheritance with "optional composition" which is UML compliant
  - Allows a mixture of components with different levels of scalability in a same radio.

Specification of Lw and ULw AEPs

Better enforcement of POSIX conformance

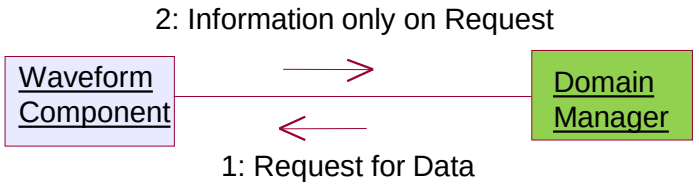
Support of, typically, DSP Operating Environments

International convergence is at hand

2 Enhanced Information Assurance

- **Design patterns and strategies incorporate security awareness**
- **Remove ability for a component to query information that could be inappropriately used**
- **Possibility of clients requesting information they should not have removed by utilizing a 'push' model**
- **Harder to get an object reference to the DomainManager and learn about the system**
- **Naming Service deleted**

SCA 2.2.2



SCA 4.0

Improved Performance

Faster Boot Times due to Port Connection improvements

- Allows faster connections, reducing waveform startup boot time
- Permits connections to be defined at build time…Reduces startup and security issues

Improved realtime performance

- Moving towards middleware independence
  - CORBA can be avoided for deeply embedded software
  - Will help support very small processors

4 Reduced Development Costs

Static analysis tools will have more prominence

- Test all paths in the code
- Find errors much earlier in the development process.
- Provide immediate assistance by linking errors directly to the specification - this is a good way to “teach” the spec as code is being written.

Requirements cleanup

- Introduce common requirements tags (SCAXXXX)
  - Can be used for both US Govt and commercial/international markets
- Reduced number of requirements
- Removal of some redundant requirements

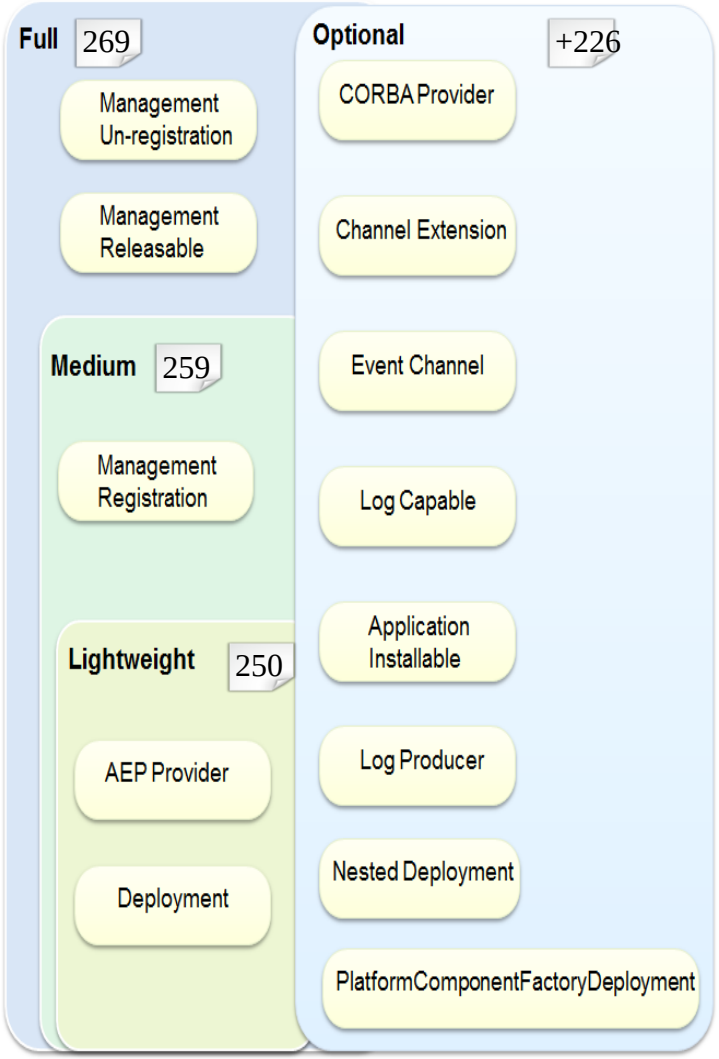
Testability Improvements

Total test time reduced based on profile implemented

- Cost of increase test coverage complexity

Units of functionality and multiple base AEP profiles with optional function groups allow crisper test definitions

The backwards compatibility UOF added to 4.1 done in a test-friendly way



Improved Portability of WF designs

Specification of PIM (Platform Independent Modelling) IDL Profiles

- Full Profile
- ULw Profile

Rationalization of PSM IDL Profiles

Expanding scope to PHY Layers

Full and ULw PIM IDL Profile applicable to DSP and FPGA

International convergence is at hand

Investment Protection

SCA 4.1 ensures investment in SCA 2.2.2 applications can be reused in SCA 4.1 environment

- Re-introduce the DomainManager to obtain the proper allocation properties that are associated to a Device
  - Allows the ApplicationFactory to use a Device for deployment

Support for applications composed of a mixture of SCA 4.1 and SCA 2.2.2 components.

- Allow developers to perform a more incremental transition from SCA 2.2.2 to SCA 4.1

Enhance the ability to migrate legacy waveforms to an SCA model

- Naming convention changes