WAVEFORMS for WARFIGHTERS

Software Communications Architecture (SCA) 4.1 Review

JTNC Standards
19 August 2015

SCA 4.1 BLUF

In development for 2 years
- First SCA 4.1 workshop was 21-22 Nov 13 at Raytheon, San Diego

- **Technologies and features of the new version**
  - Cyber Hardening
  - Performance
  - Scalability
  - Configurability
  - Future-proofing

- **Commercial industry provided much of the technology and design of SCA 4.1**

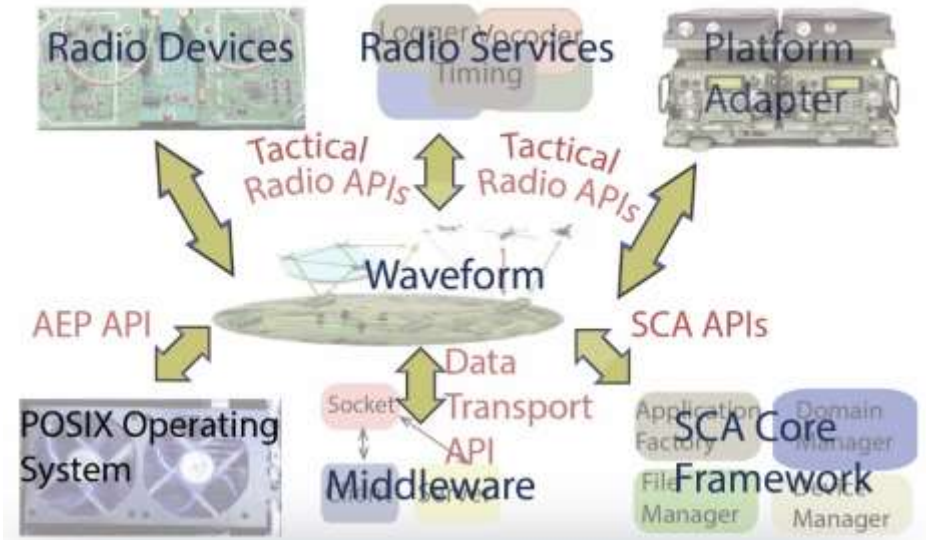
- **SCA 4.1 will be submitted to the DoD IT Standards Registry (DISR) in FY16**

Benefits to the Warfighter

- Cyber Hardening
- Smaller Radios
- Longer Battery Life
- Faster Bootup
- Better Connections with External Devices such as Android
- Future-proofing

SCA Continues to Distinguish Itself from Competing Standards

- **SCA provides a framework similar to iOS and Android but allows flexibility**
- **SCA is different from iOS or Android through the expression of waveforms in software (Software Defined Radio)**
- **The SCA is managed and controlled through an open systems standards body**
- **The SCA isolates the waveform from the radio set, enabling portability of waveforms across radio missions and manufacturers**



SCA Radios – In Widespread Deployment

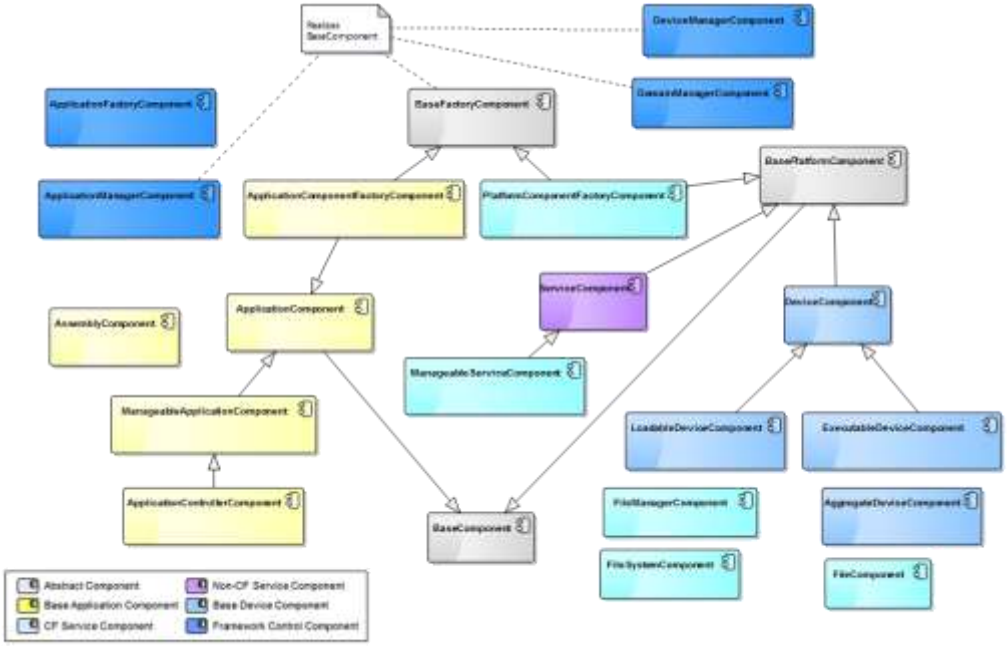
- **Handhelds such as AN/PRC-154, AN/PRC-152, AN/PRC-148 have been fielded in quantities of over 300,000**

- **Airborne, manpack, and multi-channel radios include MIDS-JTRS, HMS Manpack, AN/PRC-117G, FlexNet, Phoenix, Freedom 350, KOR-24, CRIIS, Talon, Sidehat, Sidewinder, and many more …**

Architecture Changes in SCA 4.1

Architecture

- SCA 4.1 introduces a single base component that is applicable for both platform and application software
  - Earlier versions of the SCA had mixed components and interfaces, complicating the specification
  - A smaller number of components are reused across the full radio domain

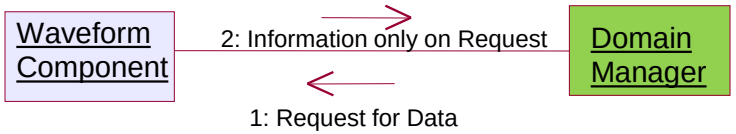


- The reorganization will streamline implementations and allow better software tooling to be developed for SCA developers

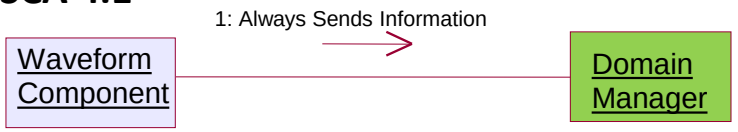
Cyber Hardening in SCA 4.1

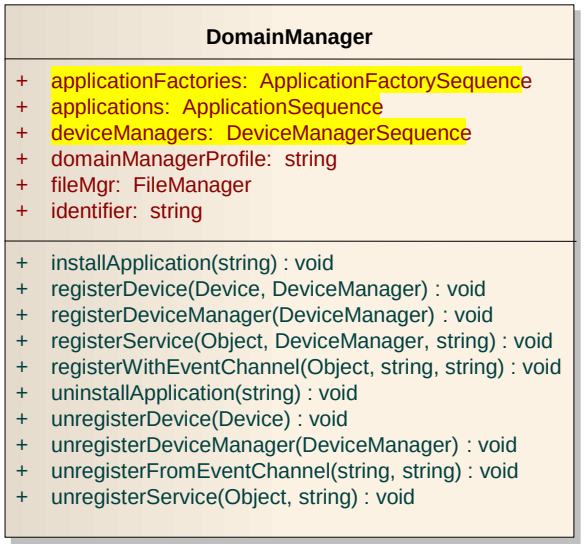
- **Secure computing practices have evolved since the first SCA version**
- **Push model registration provides more secure communication between components**
- **As part of the architectural refactoring, the principal of least privilege was applied to all communication within the architecture**
- **Access and visibility of all software components has been reduced to only what is absolutely needed**
- **This minimizes system exposure to a 'rogue' software component within the radio**

SCA 2.2.2



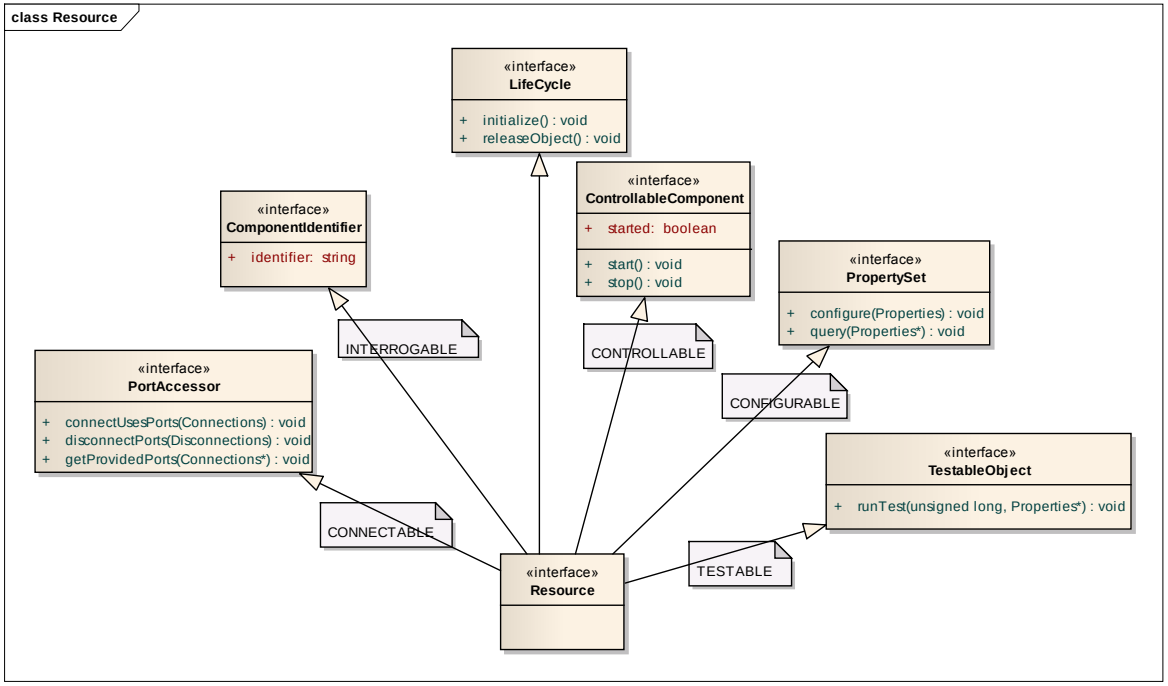
SCA 4.1





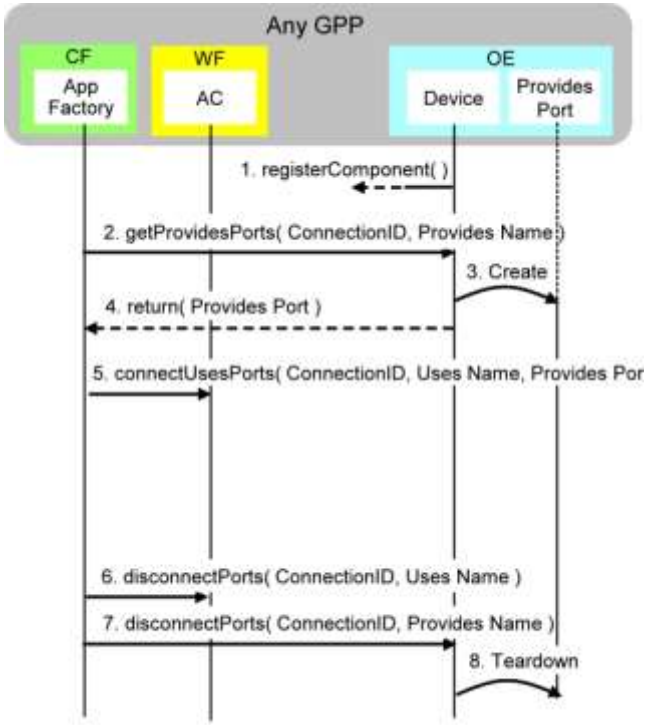
Reducing the Cost of the Radio – Scalability and Flexibility

- SCA 4.1 reduces software development and testing by tailoring functionality and interfaces not required for the radio's mission
- Earlier versions of the SCA had a one-size fits-all model
- In SCA 2.2.2, a component had to implement all of the interfaces whether they were specifically needed for the component or not



Improving Performance

- The SCA has little impact on waveform data throughput
- The software components of the waveform communicate among themselves without any SCA overhead or interference
- During startup, there can be substantial dynamic configuration and loading of software components
- The new port communication and push registration significantly reduce the time to boot the radio or launch a new waveform
- This extends battery life, reduces the processor size and resources necessary to perform the mission



Future-Proofing

- **SCA 4.1 has been written as a modular specification, permitting new technology to be inserted into tactical radios**
- **As an example, there are emerging technologies to replace CORBA such as ICE or zeroMQ**
- **SCA 4.1 is written to allow new transports to be substituted for CORBA, which most SCA developers to date have preferred**
- **New to SCA 4.1 is multicore processor support**