



Joint Tactical Networking Center (JTNC)



JTNC Overview & SCA 4.1 Test Suite Demo

Prepared For:

WinnComm 2022

15 December 2022



Agenda



- **JTNC Overview**
- **JTEL Test Tools**
- **SCA 4.1 Test Suite Demo**
- **Q&A**



JTNC Overview



JTNC Mission and Vision

(JTNC Charter - 13 September 2019)

Chartered Mission

“To enable the DoD’s rapid identification, characterization, procurement, fielding, and sustainment of modular, innovative tactical communications products that ensure secure, interoperable, and resilient Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR) capabilities.”

Chartered Vision

“Secure, Interoperable, and Resilient tactical communications capabilities aligned to modular open architectures in support of Service, Multi-Service, and Coalition forces.”





JTNC Core Functions*

- **DoD Information Repository (IR)**
 - Maintain a cyber-hardened DoD Information Repository (IR) providing controlled access for proprietary and non-proprietary waveforms
 - Maintain government configuration control of assigned IR products and datadocuments
- **Technical Analysis**
 - Perform capability characterizations/technical analyses on tactical communications products assessing the degree to which products meet their advertised capabilities and align with DoD wireless communications, cybersecurity, and interoperability standards and policies
- **Open Systems Architecture Standards**
 - Provide expertise, configuration management, and interface development for non-proprietary open systems architecture standards and interfaces that enable common radio, waveform, and network management functionality, and allow for rapid integration of enhanced technology/innovative capabilities
- **Exportability Analysis & Licensing Review**
 - Perform analyses to determine issues affecting potential exportability of tactical communications products
 - Review Software Defined Radio (SDR) and Waveform (WF) export license requests
- **Technical Advisor (Lead Service Initiative and Command, Control, and Communications Leadership Board (C3LB))**
 - Provide subject matter expertise on tactical communications products and/or Joint enterprise tactical networking as requested or identified in support of the DoD, the Services, and Program Offices
 - C3LB participation (Tactical Communications Senior Steering Group (TCSSG), Communications Technology and Waveform Working Group (CTWWG), HFWG))
 - Support both the Services and Principal Staff Assistant (DoD CIO) in oversight of Lead Service activities

* Ref: Documented in JTNC Charter, approved 13 September 2019

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DoD Communications Standards Team



Purpose: Provide expertise to evolve, align, and promulgate open standards for the DoD and industry (including coalition and international partners).

- Scope:**
1. To continue to improve DoD's progress towards the accelerated deployment of interoperable, secure, resilient waveforms and tactical networking products.
 2. To Collaborate with related government and industry organizations to identify and close tactical communications gaps
 3. Develop and publish standards and specifications across DoD, NATO, Coalition, and industry

Key Priorities:

- SOSA, CMOSS, etc.
- Sustainment of existing APIs
- Standards Library Management
- Many others...

Stakeholders:

DoD

- Modular Open Systems Working Group
- DoD High Frequency (HF) Working Group

Program & Project Level

- Space Force Mobile User Objective System
- PEO C3T - PM-TR
- Army C5ISR – CMOSS
- Many others...

Industry Engagement

- SOSA and FACE™ Consortiums
- WinnF





On-Going JTNC Efforts in support of SOSA™



- **Definition of the communications capability within the SOSA™ technical standard**
- **Development of Visual Tool Chains and Conformance Test Tool to enable SOSA developers to complete the product development cycles**
 - **Development of a reference implementation of the SOSA™ System Manager to ensure interoperability across SOSA products**



Capability Development Team JTNC Test and Evaluation Lab (JTEL)



Purpose: Provide expertise in Test and Evaluation (T&E) of DoD Communications Standards for Tactical Communications products.

Scope: The JTEL is the test authority for the DISR mandated communications standard, the Software Communications Architecture (SCA) SCA v4.1 including the JTNC Standard APIs. JTEL develops test capabilities and provides excellence in test execution as well as the development of test capabilities for emerging and current communication standards such as the Sensor Open Systems Architecture (SOSA) and Future Airborne Capability Environment (FACE™)

Operational Relevance:

Provide Conformance Evaluation capability where stakeholders can leverage JTNC expertise to verify that WCPs have implemented DoD-approved standards, thereby increasing interoperability, security, and reusability.

- Develop and maintain test capabilities for Open System Architecture (OSA) standards such as Software Communications Architecture (SCA) and JTNC Standard APIs.
- Conduct compliance assessments of Software Defined Radio (SDR) waveforms and radios against OSA Standards

Key Priorities:

- Complete SCA v4.1 automated test capability for OE
- Support SBIR efforts to develop SCA v4.1 automated test capability for WF
- Support development of emerging standards such as SOSA, FACE, etc.
- Development of SOSA Common Test Framework





JTEL Test Tools



Planned SOSA™/CMOSS Tools and Platforms/Procedures



- **Future Tools developed by JTNC**

- SOSA™ Common Test Framework (SOSA™ CTF)

- Connects to SOSA™ Sensor Systems to provide automated, manual and demonstration test capability of SOSA™ Technical Standards
- Can be easily adapted to provide the automated, manual, and demonstration test capabilities for CMOSS System

- **Future Platforms**

- Reference Implementation of the SOSA™ System Manager and Task Manager is used for testing and demonstration of SOSA™ test tools and sensor systems

- **Future Procedures**

- SOSA™ Common Test Framework Application Programming Interface enables different SOSA™ test tools to run inside the SOSA™ CTF and provides a unified test environment and co-related data output interpretation for different Open Technical Standards



SCA 4.1 Tools and Platforms/Procedures



- **Tools available through JTNC**

- SCA 4.1 Test Suite (STS)

- Connects to SDR to provide automated, manual and demonstration test capability of SCA 4.1 Operating Environments (OE).

- SCA-Pass (Vistology) / SCA Complete (Reservoir Labs)

- Test tools that connect to a Software Defined Radio (SDR) and provide automated testing of SCA 4.1 Waveforms (WF).

- **Platform**

- Viavi eCo Hub SCA 4.1 Core Framework (CF) used for testing and demonstration of SCA test tools.

- **Procedures**

- JTEL provides manual test procedures for SCA compliance testing using WF source code only.



SCA 4.1 Test Suite Demo



SCA 4.1 Test Capability – SCA Test Suite (STS)



- **SCA v4.1 Test Suite (STS) – provides automated test capability for SCA v4.1 conformance of a Software Defined Radio**
 - Executes test event for radio compliance
 - Provides test results with Pass/Fail status of SDR's compliance to SCA v4.1 specification

SCA 4.1 Test Artifacts – SCA 4.1 Test Suite (STS) Application

The screenshot displays the SCA 4.1 Test Suite (STS) application interface. The window title is "STS - OE_MockRadio_1.0". The interface is divided into several sections:

- Test Selection:** A tree view showing various test cases categorized by component. The "Mandatory Test Cases" section is expanded, showing "BaseComponentMandatoryDomainProfile" and "BaseComponentMandatoryDomainProfileValidation" selected.
- UoF Configuration:** A section for configuring the Underlying Functional (UoF) configuration.
- Test Runner:** A section with buttons for "Run Selected Tests" (green play icon) and "Stop Running Tests" (red stop icon).
- Test Summary:** A section displaying the results of the test run. It shows two tables of "Selected Test Cases by Component".

The first table, titled "BaseComponentMandatoryDomainProfile - DomainManager", contains the following data:

Select	SCA Tag	Status	Test Type	Notes
<input checked="" type="checkbox"/>	SCA502	Passed	Automatic	SCA502 Passed. All profile files for this component had valid headers.
<input checked="" type="checkbox"/>	SCA427	Passed	Automatic	SCA427 Passed. Associated profile files were found for this component.
<input checked="" type="checkbox"/>	SCA495	Passed	Automatic	SCA495 Passed. All SCD files for this component had the .scd.xml extension.
<input checked="" type="checkbox"/>	SCA503	Passed	Automatic	SCA503 Passed. All SPD files for this component had the .spd.xml extension.
<input checked="" type="checkbox"/>	SCA494	Passed	Automatic	SCA494 Passed. All PRF files for this component had the .prf.xml extension.
<input checked="" type="checkbox"/>	SCA501	Passed	Automatic	SCA501 Passed. All DTD files for this component had the .dtd extension.

The second table, titled "BaseComponentMandatoryDomainProfileValidation - DomainManager", contains the following data:

Select	SCA Tag	Status	Test Type	Notes
<input checked="" type="checkbox"/>	SCA463	Passed	Automatic	SCA463 Passed. All profile files for this component were valid.

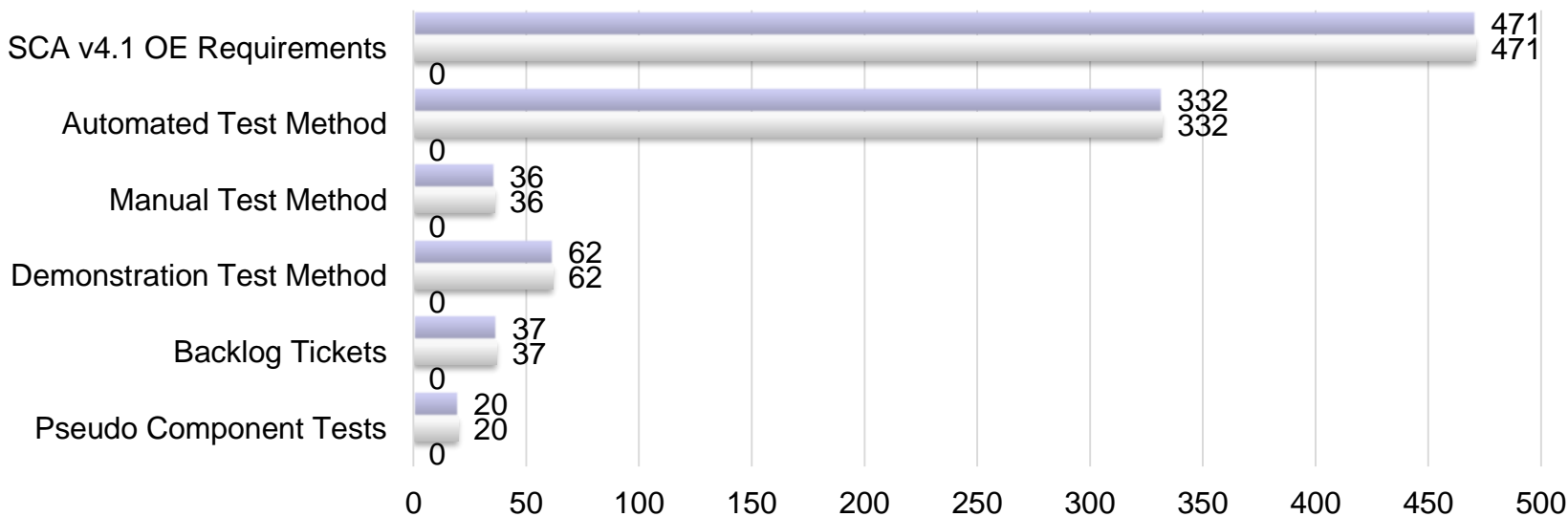
At the bottom of the window, a status bar indicates "Connection is mocked" and "Current Test Run Progress: 100.0% (7/7)".



STS v1.2 - SCA v4.1 Test Capability December 2022



SCA Test Method



	Pseudo Component Tests	Backlog Tickets	Demonstration Test Method	Manual Test Method	Automated Test Method	SCA v4.1 OE Requirements
Total Requirements	20	37	62	36	332	471
Developed	20	37	62	36	332	471
To be developed	0	0	0	0	0	0

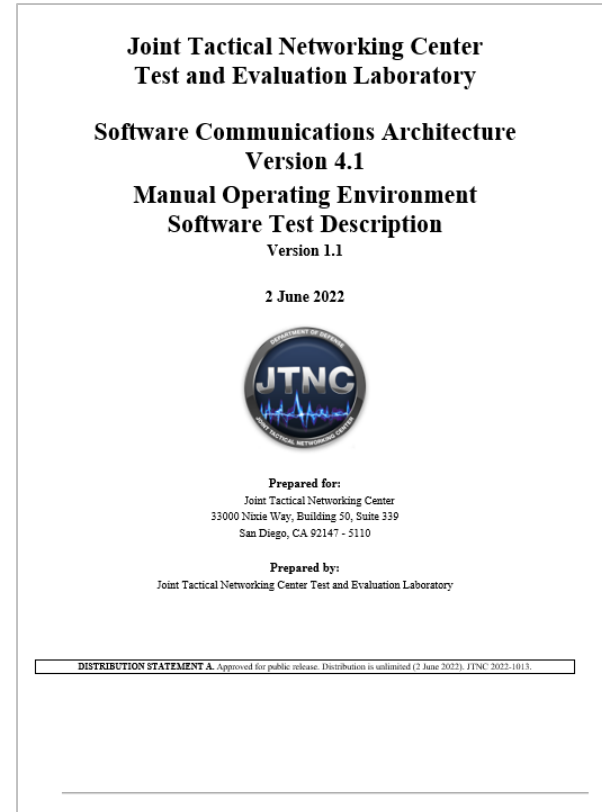
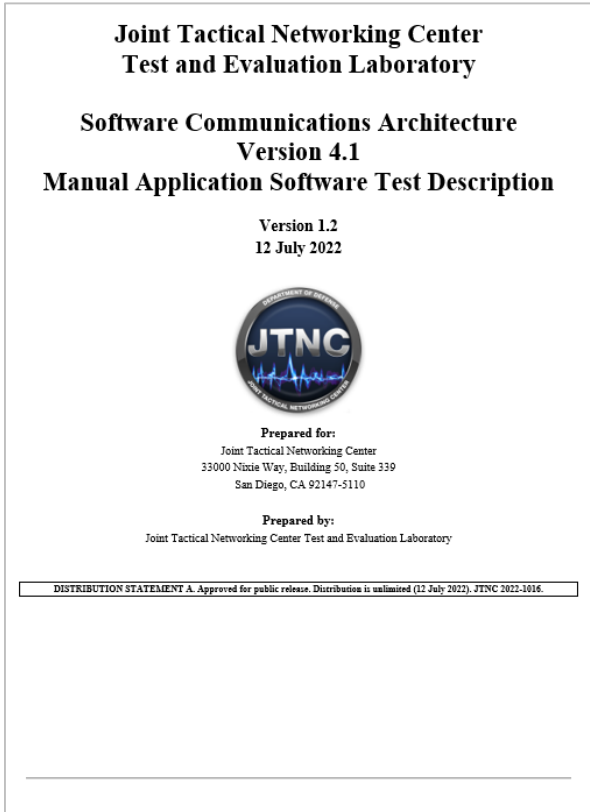
■ Total Requirements ■ Developed ■ To be developed



SCA 4.1 Test Capability



- **SCA 4.1 Test documentation**
 - JTEL SCA v4.1 Manual AP Software Test Description
 - JTEL SCA v4.1 Manual OE Software Test Description





SCA 4.1 Test Capability – SBIR



- **Waveform test tool – Provides SCA v4.1 Automated Test Capability for Waveform Applications**
 - Vendors:
 - Reservoirs Lab – SCA Complete
 - VIStology – SCA-Pass
 - Features:
 - Executes test event for radio compliance
 - Provides test results with Pass/Fail status of SDR's waveform compliance to SCA v4.1 specification



SBIR Efforts

Purpose:

Develop SCA v4.1 Automated Test Capability for Waveform Applications

Benefits:

- Leverage SBIR funds to develop needed capabilities
- Provide different options to choose the best technology
- Promote competition to lower licensing and testing costs

Reservoirs Lab – SCA Complete

Topic: Dynamic SCA v4.1 Compliance Test Platform

SBIR: Phase II

POC:

- **Sponsor:** NAVAIR
- **SBIR Vendor:** Reservoir Labs

Technological Approach

- Modular platform architecture leveraging from SCA v2.2.2 test platform

Status:

- Phase II ended in Nov 2021

VIStology – SCA Pass

Topic: SDR Automated Testing Solution

SBIR: Phase II

POC:

- **Sponsor:** PEO C3T
- **SBIR Vendor:** VIStology

Technological Approach

- Semantic technology

Status:

- Phase II Contract awarded in Mar 2021

Leverage SBIR funds to develop needed test capability and provide competing test solutions for WF Applications



SCA v4.1 Verification Path Forward



- Continue to maintain SCA v4.1 test capability
- Potential option for General Public access to SCA v4.1 compliance testing tools
 - Public webpage on JCM similar to what was done for CMOSS (download metrics would be available)

CMOSS Document Request Page on JCM

A Guide for the Form is available with step-by-step instructions.
[Click Here to View the Guide](#)

If you are having issues accessing/viewing the document picklist and are actively logged in to the JCM, please log out of the JCM and try again or use an incognito window for your request.

CMOSS Document Request

Prior to accessing desired documents, please fill out the information below.
Please note that you will need to verify your email to continue.

* Name

* Email

* Company

Please select desired documents below.
You will be able to add to your selection later.

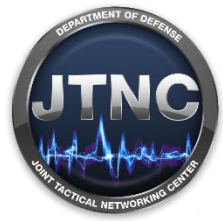
* Documents Requested

- CMOSS Overview
- CMOSS IRS
- VICTORY DI2E Access Instructions
- MORA DI2E Access Instructions
- VICTORY Training Material

<https://jtnc.experience.crmforce.mil/JTNC/s/cmoss>



Action items



- Approval from JTNC to downgrade STS and STS documents to Distro A - **In Progress**
- Approval from JTNC to downgrade SCA v4.1 MOESTD and MASTD to Distro A - **Completed**



Display SCA 4.1 Test Tool Demo



Questions