

Topic: N163-D02

ObjectSecurity LLC

Supply Chain Risk Analysis & Management System (SCRAMS)

ObjectSecurity, a small company in downtown San Diego traditionally focused on cybersecurity, has branched out into data analytics and Artificial Intelligence (AI). ObjectSecurity's award-winning, patented security product is OpenPMF, employs cool models and algorithms to make it easy to author and maintain fine-grained, dynamic access control policies. ObjectSecurity is engaged in exciting product development to include a supply chain risk analysis product which integrates legacy SAP data dumps and into a graph database, suitable to run risk data analytics. Another, ObjectSecurity project is "AI hacker", which leverages AI to simulate a hacker. ObjectSecurity is a spin-off of the University of Cambridge Computer Laboratory. ObjectSecurity's focus is to transfer the results of academic research to consulting and industrial research and development, and bundle the abilities of several experienced scientists, consultants, programmers and security technology specialists. ObjectSecurity is fully employee-owned.

Technology Category Alignment:

Human/Autonomous System Interaction and Collaboration

Machine Perception, Reasoning and Intelligence

Protection, Sustainment, and Warfighter Performance

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SYSCOM: SPAWAR

Contract: N68335-17-C-0540

WHO

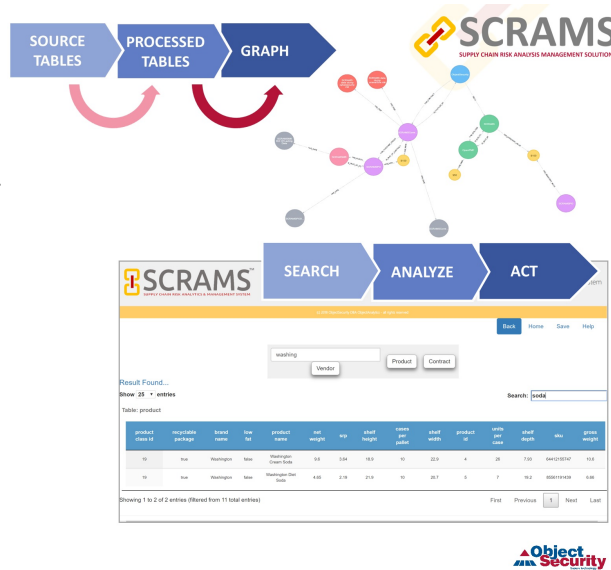
SYSCOM: SPAWAR

Sponsoring Program: Navy Modernized Hybrid Solution (NMHS)

Transition Target: PEO C4I supply chain data processes - Navy Enterprise Resource Planning (ERP) or others

TPOC: (619)221-7918

Other transition opportunities: Other Navy SYSCOM supply chain (Navy ERP) processes. DoD and government SAP-based enterprise solutions.



SCRAMS Prototype Copyright ObjectSecurity, 2018

WHAT

Operational Need and Improvement: Navy's information systems need to function as expected. Employment of components that are counterfeit, tampered with, or otherwise compromised can have catastrophic effects. The Navy needs broader and deeper visibility into supply chain information in order to be able to identify potential supply chain risks. Automated supply chain risk analytics are required because there is too much information for humans to process.

Specifications Required: Supply chain data sources need to be made available as a data dump, for example from Navy ERP, an SAP installation, SCRAMS ingests the data dump into a graph database to enable advanced search and risk analytics. There is an upfront cost for non-SPAWAR customers because Navy ERP data is not 100% identical across the Navy enterprise. However, ObjectSecurity has developed an in-house data ingestion service that leverages automation to keep cost low.

Technology Developed: SCRAMS helps identify and analyze procurement supply chain risks across internal and external supply chain information. SCRAMS ingests information using state-of-the-art graph analytics. SCRAMS identifies risks automatically, providing risk managers the capability to search, inspect analytics, and produce reports. SCRAMS leverages a graph database to store information, allowing for advanced relationship-based searches. Under the hood, SCRAMS runs automated analytics to be enhanced by artificial intelligence (AI) during the Phase II option, to identify risks from the data graph.

Warfighter Value: Lower supply chain procurement risk provides the warfighter high confidence that equipment will function as expected (reduced failures or system compromises). For procurement professionals (especially contract managers), SCRAMS identifies risks before, during and after procurement. At the same time, SCRAMS is low-risk in that it does not need to be connected online with Navy ERP - it can be used as a standalone tool accessed through a web browser.

WHEN

Contract Number: N68335-17-C-0540 **Ending on:** March 24, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
First partial prototype developed (ingestion, visualization, searching)	Med	prototype demonstrated & accepted	3	March 2019

HOW

Projected Business Model: SCRAMS will be offered for purchase to any organizations that use SAP as an ERP, especially for procurement. ObjectSecurity's proposed business model includes licensing, annual maintenance, and support contracts (configuration/customization and data services). While SCRAMS is cloud-ready, ObjectSecurity does not foresee a public cloud service offering as viable because SCRAMS stores highly sensitive organization-internal information. ObjectSecurity foresees a private cloud-style deployment for customers. The value proposition is that SCRAMS will find risks humans often miss, at a much lower cost.

Company Objectives: Offer SCRAMS as one of the main pillars of ObjectSecurity's future product portfolio. Sell SCRAMS to the government, prime contractors, and commercial manufacturers (automotive and semiconductor). Seek partnerships with Prime contractors to deliver SCRAMS to the DoD. ObjectSecurity plans to rebrand SCRAMS under its ObjectAnalytics product line - which focuses on analytics, AI, and supply chain risks.

Potential Commercial Applications: The commercial application is clear - SCRAMS automatically identifies supply chain risks and lets users manually search and discover potential risks. For the commercial sector, ObjectSecurity would include additional risk analytic indicators to address specific business sectors e.g. for manufacturing, potential analytic indicators may include loss of production, reputational damage, inefficiencies, the potential for optimization, etc. ObjectSecurity is actively targeting the automotive industry as a potential market for SCRAMS.

Topic: N162-106

Technology Service Corporation

Advanced High Speed Bus Technologies for Units Under Test (UUT), Test and Evaluation

Technology Service Corporation (TSC) is a high technology company providing engineering consulting and products, electronic components for microwave, digital processing computer software, and automated test & control systems to the U.S. Government and industry. TSC is developing a High-Speed Bus Tester that will utilize IEEE Automatic Test Markup Language (ATML) Std. to incorporate Open Architecture (OA) test capability into DOD standard Automated Test Equipment. Our OA design allows users to modify and expand capabilities as necessary without proprietary restraints. To reduce risk and accelerate development, TSC is leveraging our proven automated test tool, TestForge Test Execute (TE). Initial market is U.S. Navy Depot Sustainment efforts using electronic Consolidated Automated Support System (eCASS); looking for the opportunity to fully develop and mature our TE and interfaces to provide DOD with the OA solution for High Speed Bus testing

Technology Category Alignment:

Maintainability/Sustainability

Computational Research Engineering Acquisition Tools and Environment

Frameworks for Interoperability

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SYSCOM: NAVAIR

Contract: N68335-18-C-0104

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-18-C-0104

Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2018-732

Topic # N162-106

Advanced High Speed Bus Technologies for Units Under Test (UUT), Test and Evaluation

Technology Service Corporation

WHO

SYSCOM: NAVAIR

Sponsoring Program: PMA 260 and NAVAIR 4.8.6.12 Lakehurst

Transition Target: DOD Sustainment Activities and Test Instrument Original Equipment Manufacturer (OEMs).

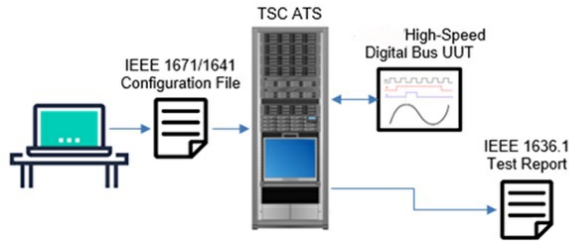
TPOC:

(732)323-4877

Other transition opportunities:

OEM/DOD Activities Family of Testers (FOT) needing High-Speed Digital (HSD) Bus testing.

Notes: Graphic represents the Technology Service Corporation (TSC) Automated Test Station (ATS) Open Architecture (OA) framework. The ATS will be rack-mounted and can be rolled up and connected to Host Automated Test Equipment (ATE) such as USN Electronic Consolidated Automated Support System (eCASS) pictured to the right.



IEEE Open Architecture Framework implementation for ATS life cycle cost reduction



Image Courtesy of Technology Service Corporation, Copyright 2018. Includes NAVAIR image, <https://goo.gl/images/5pnKVM>

WHAT

Operational Need and Improvement: Within DoD there are a multitude of different test systems, with each of these test systems programmed differently and generally using closed architectures. This results in a fragmented knowledge base and expensive test standup requirements. DoD FOT requires OA HSD Bus test capability for units under test (UUT). TSC is developing HSD test capability using the IEEE Automatic Test Markup Language (ATML) Standard Family and an OA Tester to augment DoD FOT.

Specifications Required: The test capability will be built to IEEE 1671 Standard for Automatic Test Markup Language, IEEE 1641 Standard for Signal and Test Definition and IEEE 1636.1 Standard for Test Results. The ATS design will be based on COTS hardware and OA standards that will allow the extensibility and flexibility DoD demands while reducing life-cycle costs.

Technology Developed: The TSC ATS consists of a portable rack of COTS equipment with the TSC TestForge running on a modern PC platform. Interfaces will communicate with existing ATE and UUTs via a PXI/PXIe chassis. It will be extensible and flexible having rapid development capability through our proven TestForge software. It will have FPGA-based digital processing for validation of modern HSD Buses.

Warfighter Value: The TSC ATS will provide life cycle cost reductions by granting in-house test engineers and technicians the ability to perform automated test definitions on the fly. They will have the ability to update instruments without the need to re-compile the software. Current and future UUT testing with HSD Buses will be supported and the TSC ATS will be adaptable to any ATE family.

WHEN

Contract Number: N68335-18-C-0104 **Ending on:** August 20, 2020

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Completed Phase I	N/A	Test Executive (TE) parses UUT data in ATML	2	March 2017
Demonstrate Prototype ATS	Med	Phase II prototype tested on eCASS under CRADA with NSWC Crane	6	December 2019
Complete Phase II Base; Phase II Option Awarded	Med	Phase II conceptual feasibility proved	7	February 2020
Complete Phase II Option	Med	Expand prototype to other DoD Activities	8	August 2020
Transition to Phase II.5 or 3 to complete OPEVAL	Med	Full Rate Production Orders	9	December 2020

HOW

Projected Business Model: Our business model is to market, manufacture and sell the TSC ATS to DoD Sustainment Depots beginning with the USN FOT (eCASS), followed by other DoD Services and NATO partners. These FOTs include the USAF Versatile Depot Automatic Test Station (VDATS); selected parts of the USA Integrated Family of Test Equipment (IFTE), and USMC General Purpose Automated Test System (GPATS). In parallel, we will demonstrate the value and benefits to the test instrumentation OEMs that conform to the ATML Standard for the DoD market will result in revenue growth.

Company Objectives: TSC is an experienced DoD automatic test and control system developer and a National Instruments (NI) Systems Integrator. Leveraging the tools and expertise developed designing and delivering test capability to the Naval Surface Warfare Center, Crane (NSWC Crane), we will mature our ATS under a cooperative research and development agreement (CRADA) at NSWC Crane using eCASS as the host ATE. We anticipate positive reactions to our HSD Bus ATS capability at the 2019 SBIR/STTR Transition Program Forum, particularly from DoD Sustainment Activities and Industry manufacturers that develop capabilities requiring HSD Bus testing. Our immediate objective is to secure additional funding through Phase II.5 and/or Phase III contracts that will allow us to complete OPEVAL and prepare the ATS for Full Rate Production (FRP). We will commercialize the TSC ATS so those requiring HSD Bus test capability can benefit by having a flexible, scalable, cost effective in-house HSD Bus test capability.

Potential Commercial Applications: Our ATS is purposely designed and built to seamlessly adapt and interface with any automatic test system. This should be attractive to test instrument manufacturers, either DoD or Commercial, including the automotive and aircraft industries; as well as space applications including ground stations and satellite systems. Our ATS will provide a low lifecycle cost test capability in any market where high-speed digital bus testing is required.

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Topic: N162-106

A.T.E. Solutions, Inc.

Advanced High Speed Bus Technologies for Units Under Test (UUT), Test and Evaluation

Hi-SPINOUT, adjunct to Automatic Test Equipment (ATE), enables slow, legacy ATEs to test high speed units under test (UUT). A.T.E. Solutions stands for “Advanced Test Engineering,” our aim is to find advanced solutions to test and test engineering problems. The initial platform on which Hi-SPINOUT will be demonstrated is the US Navy’s eCASS ATE at Lakehurst, NJ. Hi-SPINOUT is implemented on a Field Programmable Gate Array (FPGA), which employs reconfigurable synthetic instruments (SIs) at high speed to interface with the UUT. An important instrument in high-speed testing is the bit error rate tester (BERT) that characterizes high-speed faults such as jitter. The innovation involves a breakthrough where tests can be performed through higher speed, TPS reuse, lower TPS development cost and delivering TPS capabilities earlier.

Technology Category Alignment:

Test, Evaluation, Validation, and Verification

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SYSCOM: NAVAIR

Contract: N68335-18-C-0165

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-18-C-0165

Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2018-726

Topic # N162-106

Advanced High Speed Bus Technologies for Units Under Test (UUT), Test and Evaluation

A.T.E. Solutions, Inc.

WHO

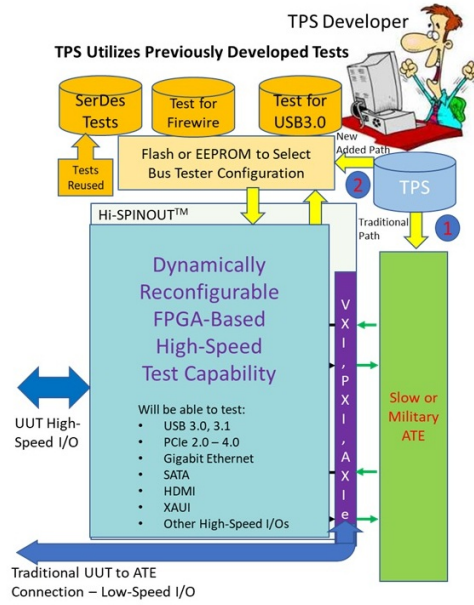
SYSCOM: NAVAIR

Sponsoring Program: PMA 260, Aviation Support Equipment

Transition Target: Aircraft avionics Units Under Test (UUTs) operating at multi-gigabit per second (Gbps) data communication rates, Electronic Consolidated Automated Support System (eCASS)

TPOC:
(732)323-4877

Other transition opportunities: Technology is applicable to all Department of Defense (DoD) test program set (TPS) development and automatic test equipment (ATE)



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WHAT

Operational Need and Improvement: A need exists to test high-speed input/output (I/O) signals from avionic line replaceable units (LRU) in military applications for automatic test equipment (ATE) developed prior to the use of data communication signals operating at Gbps data rates. The novel technology of A.T.E. Solutions, Inc. (A.T.E.) provides the necessary stimulus and response environment to test high speed I/O, resulting in lower test program set (TPS) development cost. A.T.E.'s solution is scalable and adaptable to support new and higher speed I/O bus structures for most ATEs.

Specifications Required: High-speed data buses represent new Navy avionics technology. To ensure an open architecture approach, UUT device interfaces (UDI) to test data communications should leverage industry standards. Advancements in ATE is required to support extremely high-speed data rates, complex timing, and synchronization, and high-speed multiplexing. Test parameters include statistical measurement, bit error rates, jitter and complex signal to noise and distortion measurement. Conventional test methodologies cannot achieve the test quality necessary to ensure proper performance of UUTs and maintain data integrity of high-speed net-centric information exchanges. This is driving the need for faster digital communication buses in ATE and UUT interactions.

Technology Developed: A.T.E. introduces Hi-SPINOUT (High-Speed Input/Output Test), a high-speed device interface implemented on a state-of-the-art field programmable gate array (FPGA) to support tests in the multi-Gbps range. Hi-SPINOUT employs dynamically reconfigurable synthetic instruments (SIs). SIs are under the control of the test program set (TPS) developer. High-speed serialization and deserialization (SerDes) tests are applicable for many different high-speed buses. Once a SerDes test has been developed it can be reused for other UUT tests. Similarly, entire TPSs can be employed in part or in full by other TPSs. Hi-SPINOUT is ATE-agnostic, so tests can be shared across service platforms.

Warfighter Value: Hi-SPINOUT supports tests of high-speed UUTs and reduces TPS development cost and lead times because TPS developers can reuse parts of previously developed tests. Tests developed for one ATE can be migrated and used on another ATE. With multiple TPS developers employing the same test, mistakes and omissions are more likely identified. To the warfighter, faster repair times, shorter lead time to test, more precise identification of malfunctions, better assurance of correct diagnosis all support mission completion. It also expands the ATE's useful life.

WHEN

Contract Number: N68335-18-C-0165

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Conceptual Design of Hi-SPINOUT	N/A	Identification of commercially available FPGA that can meet the requirements of the Hi-SPINOUT design	TRL 3	October 2017
Fabrication of Hi-SPINOUT Prototype	Low	Demonstrate that high-speed Synthetic Instruments can be realized within the FPGA fabric	TRL 4	February 2019
Build a USB 3.0 UUT Communication with Hi-SPINOUT	High	Communication at the USB 3.0 Link layer will demonstrate a deeper connection than only through the Physical layer	TRL 5	August 2019
Interface Hi-SPINOUT, the USB 3.0 UUT to Navy's eCASS ATE	Med	Full communication between these elements enables testing, though debugging and integration issues may still exist	TRL 6	January 2020
Demonstrate eCASS ATE with Hi-SPINOUT test USB 3.0 at speed of 5 Gbps	Med	Known-good UUT passes test. Faults are injected. Test detects and diagnosis the faults.	TRL 7	April 2020

HOW

Projected Business Model: The business model will consist of ways Hi-SPINOUT is made available: 1) In its basic form Hi-SPINOUT is sold as a programable and configurable item to provide high-speed capability to an ATE with some SIs included, 2) Additional Hi-SPINOUT SIs and intellectual properties (IPs) can be developed to customer specifications and sold separately, 3) Reusable test routines developed previously can be sold to speed test development, and 4) Test engineering services and support services are sold to create custom high-speed test solutions. While Hi-SPINOUT is an adjunct capability supplementing ATEs, it serves the TPS developer who can take advantage of test reuse.

Company Objectives: A.T.E.'s near term objective is to disseminate the Hi-SPINOUT paradigm to other services and is seeking TPS development projects that involve high-speed test applications. The Hi-SPINOUT concept, demonstrated for USB 3.0 on eCASS, is applicable to a variety of military ATEs involving high-speed buses. A.T.E. is looking to identify Navy, Army, Marine Corps, and Air Force high-speed TPS development initiatives in order to assist current TPS development efforts involving high-speed anywhere. Hi-SPINOUT is intended not only to provide tester functions, but also to serve test engineers in faster TPS development.

Potential Commercial Applications: Commercial board-level and system-level ATEs do not get updated more often than once every 3 to 5 years, typically once every 10 years. Therefore, high-speed data communications in commercial applications is also years ahead of current ATE speed and technology. Computers, mobile phones, automobile electronics and the internet of things (IOT) probably have the highest speed requirements. In each of these markets, high-speed ATE tests are inadequate. While high-speed test instruments exist from many instrument manufacturers, they are not necessarily oriented towards lowering the cost of test development. Hi-SPINOUT, exposed to a larger market will acquire more tests that can be reused and resold to others in the commercial and the military arenas, providing economy-of-scale cost savings. Product manufacturers can buy ready made tests for the high-speed communication part of their products, while lowering costs and time-to-market.

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