Department of the Navy SBIR/STTR Transition Program

DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

NAVAIR JSF19-1117

Topic # N162-086

Hardware Open Systems Technologies (HOST) Conformance Tool

Tucson Embedded Systems

WHO

SYSCOM: NAVAIR

Sponsoring Program: Various Navy Program Offices

Transition Target: Conformance and verification of hardware to standards such as Sensor Open Systems Architecture (SOSA™), Electronic Warfare (EW) Modular Open Suite of Standards (CMOSS™), OpenVPX™, based on TES' HARMONY product which provides an innovative, holistic and cost-effective conformance test tool.

TPOC:
(301)757-3229

Other transition opportunities: This technology is intended for use by verification authorities, Navy/Army test labs, vendors, and military depots. Applicable standards include: Sensor Open Systems Architecture (SOSA™), Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR), Electronic Warfare (EW) Modular Open Suite of Standards (CMOSS™).

Notes: Embedded images are courtesy of the U.S. Department of Defense: https://www.army.mil/e2/c/images/2015/11/15/415961/original.jpg, and https://media.defense.gov/2014/Mar/11/2000783825/-1/-1/0/140310-F-NG006-001.JPG;

Copyright Tucson Embedded Systems, Inc. 2019

WHAT

Operational Need and Improvement: HOST is an Open Systems Architecture (OSA), which defines virtual and physical interfaces to hardware, such that interoperability and reuse of hardware components can be realized. The HOST standard leverage commercial technology combined with form factor. HOST supports greater application of COTS modules from a growing market ecosystem. The intent of HOST is to establish performance and interface requirements that are open, enforceable, and testable. Innovations, new methodologies and tools are required to facilitate testing so that conformance assessments can be accomplished in a cost effective manner which avoids barriers to entry for hardware suppliers.

Specifications Required: An innovative conformance test tool, which will support and add automation to the verification of hardware conformance to the HOST Standards for form factor and functionality. The test tool should address form, function and electrical/mechanical interfacing of candidate HOST computer components as well as test for HOST-System Software functionality. The solution should be capable of testing OpenVPX™ 3U and 6U computer hardware to determine their adherence to the HOST requirements.

Technology Developed: Leveraging Tucson Embedded Systems (TES) existing Model Based Engineering (MBE) and Model Based Testing (MBT) capabilities and product, AWESUM®, to provide an infrastructure to validate conformance of hardware, firmware and software against modeled requirements. TES' holistic conformance solution, HARMONY, formalizes requirements specifications in technical standards enabling the formal validation of those resultant requirements creating a fully bi-directional traceability matrix of requirements->test->results. HARMONY, originally developed to test HOST conformance, can be used to test conformance of hardware, firmware and software against standards such as SOSA™, CMOSS™, and OpenVPX™.

Warfighter Value: HOST HARMONY ensures mission processors, storage, graphics and I/O modules can readily be upgraded, delivering new functionality to the Warfighter as technology evolves. In addition, the work performed under this SBIR is creating a new paradigm for future testing of military hardware / software / firmware standards conformance bringing the promise of rapid-safe-secure integration of new Warfighter technological capabilities to become a reality.

WHEN

Contract Number: N68335-18-C-0274 **Ending on:** March 31, 2020

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Demonstrate conceptual feasibility using AWESUM® tool	N/A	Demonstrated conceptual feasibility	TRL-3	April 2017
Demonstrate 3U conformance capability	N/A	Demonstrated of 3U conformance capability in relevant Hardware-in-the-Loop (HIL) laboratory environment	TRL-6	February 2018
Demonstrate 6U conformance capability	Low	Demonstration of 6U conformance capability in relevant HIL laboratory environment	TRL-6	December 2019
Tri-Service Open Architectures Interoperability Demonstration	Low	Interoperability Demonstration of Industry 3U and 6U hardware demonstrating HOST conformance	TRL-5	January 2020
End of Phase II Option 2, estimated	Low	Demonstration of fully functional conformance capability of HOST vendor modules in a Navy Laboratory	TRL-7	May 2020

HOW

Projected Business Model: HARMONY, TES' HOST development and verification test station will be manufactured and sold by TES to Government and Industry hardware manufacturers. TES-SAVi will license TES' HARMONY technology and offer conformance validation of HOST hardware modules as a service to Government and Industry.

Company Objectives: TES specializes in mission critical hardware and software systems, validation and testing, training and research and development. This technology is intended for use by conformance verification authorities, Navy/Army/Air-Force test labs, vendors, and military depots.

Potential Commercial Applications: Conformance and verification of hardware to other standards such as SOSA™, CMOSS™, OpenVPX™, based on TES' HARMONY product which provides an innovative, holistic and cost-effective conformance test tool.

Contact: Ken Erickson, Sr. Engineer / HOST Principal Investigator
kene@tucsonembedded.com   520-575-7283 x111