

Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2018-725

Topic # N162-101

State Linked Interface Compliance Engine for Data (SLICED)

Adventium Enterprises LLC

WHO

SYSCOM: NAVAIR

Sponsoring Program: Advanced Fighter Aircraft Program

Transition Target: PMA-209

TPOC:
(301) 757-6145

Other transition opportunities: Army, Aviation Missile Research Development Engineering Center (AMRDEC) has expressed interest for the Capstone program. Future Vertical Lift (FVL) is also relevant. United States Special Operations Command has ongoing initiatives in Model Based Systems Engineering (MBSE). Large primes in industry, including Sikorsky, have expressed interest in incorporating behavioral modeling in their MBSE processes.



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WHAT

Operational Need and Improvement: The Future Airborne Capability Environment (FACE) technical standard provides a data-oriented architecture for modular components. Integrators currently use FACE data models to detect problems such as logical errors and implementation errors. Behavioral details, however, of protocols, execution, and timing are beyond the scope of current or envisioned FACE standards. With these behavioral details, early system integrators can detect interoperability issues such as communication paradigm mismatch or unspecified service requirements.

Specifications Required: Software modules that conform to the FACE technical standard or other well-defined, data driven, APIs.

Technology Developed: State Linked Interface Compliance Engine for Data (SLICED) aids integrators by automatically detecting behavioral incompatibilities and creating visualizations of complex integrated systems. SLICED uses Model Based Systems Engineering to analyze system behavior early in the design process.

Warfighter Value: Without early virtual integration, these behavioral errors can persist in the development life-cycle, becoming costly to address. Addressing behavioral issues early in the development life-cycle avoids trail and error fixes for logistical problems, resulting in decreased down time, ease of maintenance, and cost reductions for future repairs and upgrades.

WHEN

Contract Number: N68335-18-C-0218 **Ending on:** March 6, 2020

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Base	Med	End-to-end testing of all SLICED components based using the Basic ADS-B Lightweight Source Archetype (BALSA) created by the FACE consortium as sample data. Instrumented components running in a standard Linux environment.	4	September 2018
Option 1	Med	End-to-end testing of all SLICED components using BALSA based as exemplar system. Instrumented components running in a real-time environment with an ARINC 653 scheduler.	6	September 2019
Option 2	Med	End-to-end testing of all SLICED components using BALSA as exemplar system. Instrumented components running in a real-time environment with a fixed priority scheduler.	7	March 2020

HOW

Projected Business Model: SLICED will be commercialized as part of Adventium's overall MBSE tool offering through a three-step approach: 1) direct transfer to a DoD Lab (this is the goal of the proposed option), 2) availability on Adventium's Curated Access to Model-based Engineering Tools (CAMET) Library, and 3) service offering to support specific applications of SLICED and Adventium's other MBSE tools. The following describes these steps:

Initial Navy Program Target: SLICED primary DoD transition pathway is to a Navy integration lab selected during the Phase II. Once selected, we will work closely with lab personnel to support features and capabilities required for that program with the target to transfer capabilities

Company Objectives: Adventium has multiple separate MBSE developments underway producing a variety of analysis tools for models written in the Architecture Analysis and Design Language (AADL). These analysis tools are distributed as plugins for the Open Source AADL Tool Environment (OSATE) but are applicable to a range of industries. In addition to military and aerospace uses, Adventium also has a significant research thrust in medical device safety and security, which also benefits from MBSE. Our goal at FST is to gain exposure to Navy-specific primes and MBSE engineers who are not a part of Capstone.

Potential Commercial Applications: MBSE is used in multiple fields including: Medical Devices, Automotive, Avionics, and Space systems. In all of these fields, increased reliance on software is leading to increased development costs and long term maintenance issues.

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