

S²MARTS “Coming Soon” Opportunity (22-05)

Additively Manufactured Prototypes for Hardware Technology Protection

The Department of the Navy (DoN) is seeking prototypes that demonstrate one or more Additive Manufacturing (AM) techniques to protect against one or more identified Technology Protection (TP) threats.

AM is a technology that can build 3D structures using methods that add material, as opposed to traditional subtractive methods which remove material from a blank starting form. AM methods include physically adding material layer-by-layer, as well as continuous methods. The potential for building near-arbitrary 3D structures has led to significant investment and growth of the AM industry; current technologies allow for printing polymers, metals, ceramics, and multi-material structures, while research hopes to enable directly printing complex electronics, reactive and responsive structures, sensors, and biological tissues, among others.

TP is a broad term for the protective measures a system can utilize against unwanted intrusion or compromise. A simple example is hardware designed such that a visual inspection does not reveal its technology, while more advanced TP methods may identify hardware which has been modified or even self-destruct upon evidence of tamper.

Although the exponential advancements in AM technologies have spurred significant investment from Department of Defense (DoD) Research organizations, Office of the Secretary of Defense (OSD) Manufacturing Innovation Institutes, and the Defense Industrial Base (DIB), AM's applications in the TP space have been limited. This is due to a knowledge gap that exists between AM practitioners (who generally do not work with TP requirements) and their TP counterparts (who generally do not have AM experience) along with a lack of specified funding for their integration. This prototyping effort is an opportunity for the AM and TP communities to collaborate on innovative AM technologies to meet current and future TP mission needs.

This prototyping effort would further AM and TP collaboration through additional funding, new partnerships, and enhanced capabilities focused on novel sensors, secure packaging, and integrated board-level protection.

The Additively Manufactured Prototypes for Hardware Technology Protection Other Transaction Authority (OTA) prototype project is anticipated to be released and executed in a 24-month period of performance.