OBJECTIVE: Develop and demonstrate a Cross Domain Processing Solution (CDPS) for Group 2 UAS and Dismounts.

DESCRIPTION: The Army's FTUAS program is bringing rapid innovation and new capabilities to the US Army's combat brigades. The FTUAS program is reducing the size of drones at the same time as bringing increased capabilities. The evolution of small form factor SIGINT, EWW, and mini EO/IR with lasing payloads will greatly enhance the military utility of the Army's FTUAS. To provide an advanced exploitation and dissemination experience to both external uses and the FTUAS operations, onboard data processing at varying simultaneous security classification levels is required. The Cross Domain Processing Solution (CDPS) must offer power efficiency and compact size to fly on a Group 2 UAS. The solution shall manage processing of (2) or more domains simultaneously. The CDPS shall process and provide operators in the FTUAS ground control station with relevant data applicable to their security classification and mission needs. This solution also needs to implement a framework for date and time accuracy where GPS may not be available for extended durations. This capability, when complete, will support increased interoperability for Advanced Teaming mission threads.

In addition to the DoD environment, this proposal has potential for commercialization. The technology could be leveraged in mainstream IT to provide physical separation between sites and networks. Another potential commercial application would be in the delivery of data by commercial unmanned vehicles to multiple, distinct customers during flight.

PHASE I: Identify the key component technologies required to support the performance, size, and cost goals for the CDPS. Model the system to show what processing performance (CPU and graphics) will be achieved within the Size Weight and Power (SWAP) constraints of FTUAS. The weight should be less than 5lbs and the power should be less than 100 watts. The initial analysis should demonstrate the cost to produce the system within the FTUAS SWAP constraints and the path ahead for receiving certification from the NSA for multiple domain processing.

PHASE II: Design and develop a hardware prototype unit to show the feasibility of processing data and providing date, time information for FTUAS in the constrained SWAP environment. Test and demonstrate key technologies to support an initial capability and identify areas requiring additional research. Demonstrate as many performance parameters as feasible and identify growth path to full performance with the FTUAS swap. Identify key risk areas where performance due to SWAP is a concern. Validate plan for NSA certification.

PHASE III DUAL-USE APPLICATIONS: Deliver working units to the FTUAS program for integration and test. Obtain NSA certification to operate on designated networks. Obtain commercial certification for distribution to multiple, distinct customers.

REFERENCES:

1. NIST Special Publications 800 Series
3. Cross Domain Enterprise Service Site, public.cyber.mil/cdes

KEYWORDS: CDS, Unmanned Aircraft Systems, GPS, EWW, EO/IR, SIGINT, NSA