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CYBER-ASSURED SPACE INTERNET DEVICE (CASI-D)

Abstract

The global economy is undergoing a significant shift in dependency from terrestrial networks to the space segment. In-Space Manufacturing is a major driver of this transition. Over the next 10 years this will result in close to 25,000 satellites launched into space, USD1.2 trillion in commercial retail and more than 500,000 petabytes of data. A majority of these platforms will be CubeSats. This development highlights the economic and data security risks associated with the greatly expanded aperture of vulnerability created by the dramatically increased dependency on cyber-based space infrastructure. The Cyber-Assured Space Internet Device (CASI-D) project determines the feasibility of developing a small form factor, and low-cost device capable of securing the future space internet. If successful, the device will open up new opportunities for innovators and explorers in space not currently possible. CASI-D is expected to cost under USD100, and 50 percent of the market is accessible.

This Small Business Innovation Research (SBIR) Phase I Project addresses an urgent security and critical infrastructure need to protect the future Space Internet. Much of the world's critical terrestrial infrastructure depend on the space infrastructure. Therefore, cyber vulnerabilities in space pose serious risks for in-space manufacturing and production. Insecurities in the space environment will hinder economic development and increase the risks to society. Current cryptographic systems require too much processing power and bandwidth, both of which are at a premium in CubeSats. The innovation also will protect human life and equipment on Earth.

This research is being conducted as a project within the Space Working Group of the National Digi-Foundry (NDF). The NDF (https://www.digifoundry.org) is a member-funded international collaboration initiative to foster continuous innovation in the digital asset ecosystem. Initially funded by the United States National Science Foundation, the organization is designed to operate as a Decentralized Autonomous Organization (DAO) and serves as a business incubator for Web 3/Industry 4.0 innovations. Our mission includes bringing valuable and innovative business models and technologies to commercial fruition.