SpaceCREST: Space Cyber Resiliency through Evaluation and Security Testing

Space systems and their services are central to modern life. All 16 critical infrastructure sectors that are vital to the economic and public safety of the United States rely on space. Space systems play an especially critical role in the Department of Defense (DoD) and Intelligence Community, including communications and intelligence collection. This makes them particularly attractive to cyber-attacks. That's why BigBear.ai and Redwire partnered to create SpaceCREST.

SpaceCREST, Space Cyber Resiliency through Evaluation and Security Testing, is a laboratory environment designed to study and evaluate vulnerabilities of space assets in a cyber physical system, develop cyber resiliency, and provide situational awareness and monitoring of those assets.

Building the Digital Twin Foundation

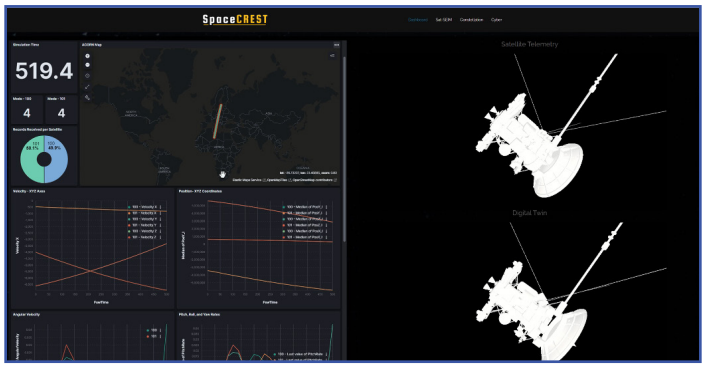
SpaceCREST's unique environment is built on a foundation of high-fidelity modeling and simulation. Redwire's ACORN-S unit creates Design Reference Missions with hardware-in-the-loop capabilities. This system generates all requisite data associated with each piece of hardware, communications, and orbit within a space asset. The generated data is ingested and prepared by BigBear.ai for advanced analytic processes focused on assessing vulnerabilities and testing cyber resiliency.

Assessing Vulnerabilities

Manual vulnerability detection can be time intensive and nondeterministic. That's why BigBear.ai developed BEARCLAW, Binary Extraction Analysis Repository / Customizable Logic Automated Workflow. BEARCLAW is a modular framework that incorporates intelligent AI/ML processes to accelerate detection of vulnerabilities and act as a force multiplier. CLAW uses BEAR data from across our ecosystem of partners to analyze and identify cyber vulnerabilities using automation.

Testing and Improving Cyber Resiliency

BigBear.ai then builds attacks around those vulnerabilities to understand and improve the space asset's cyber resiliency. Using modeling and simulation, SpaceCREST can perform catastrophic testing without physically destroying the space asset or interrupting operations. Based on those tests, BigBear.ai can develop cyber security to mitigate the risk of cyber-attacks.



Monitoring and Situational Awareness

SpaceCREST provides continuous monitoring and situational awareness of space assets. Using the digital twin, operators can rapidly identify when an attack or system failure is occurring. This enables operators to quickly respond to early detections or leverage a built-in response system to mitigate the attack or failure faster than a human.

While SpaceCREST is focused on vulnerability assessment in space, BigBear.ai's cyber resiliency through evaluation and security testing can be applied to other industries. Using modeling and digital twin simulation, BigBear.ai can rapidly integrate your devices into an evaluation and security testing environment to assess vulnerabilities and identify cyber security needs.

Email Info@BigBear.ai to request a demo of SpaceCREST. Learn more about BigBear.ai's cyber engineering capabilities at BigBear.ai.