

# Reshaping Hardware and Software Modernization

## The Challenge

Modernizing fielded platforms comes at a high resource and cost requirement due to the way legacy platforms were developed to meet the mission at the time of design; namely, they were not built for extensibility or interoperability. As software becomes the differentiator in wartime, making quick reconfigurations or changes at the hardware level is a necessity, but near-impossible with many original platform designs. With the demand to remain relevant in a tech-driven world, shrinking the time required to integrate hardware or software capabilities onto platforms is critical to maintaining an edge over our enemies.

## The Problem

To address the complexities of this challenge, the Air Force has evaluated the customary way to update fielded platforms and adopted and implement mandates for streamlined communications using standards that are known to comply with identified platforms, avoiding black-box-vendor-locked solutions from hindering fielding times. Additionally, the Air Force has used the lessons learned during previous modernization efforts that ensure that appropriate requirements are identified during the software development lifecycle and hardware integration phase to support interoperability. This approach promotes collaboration, the ability to rapidly equip legacy systems with novel hardware and software capabilities, and avoids proprietary vendor-locked solutions being leveraged in the future fight. However, interoperability and integration efforts continue to be a challenge as standards and requirements evolve causing rework and disconnects between hardware and software capabilities.

## The Approach

Tangram leveraged the transport functionality of their software integration platform, Tangram Pro™, to create an interoperable way of communicating between black-box solutions provided by other vendors and partners. The open architecture compliant, customer-owned translators realized interoperability within minutes (not weeks or months) by allowing communication between proprietary solutions of different message standards and schemas. Through approaches that are scalable, repeatable, and open-source, resources beyond time (man hours, overall costs) are now available to the Air Force to execute platform modernization moving forward.

**From Tangram's efforts, the Air Force was able to rapidly reconfigure hardware and software onto their platforms and outpace evolving threats**

*"Tangram Flex was the glue, and we couldn't have done any of this without them"*

*- DoD Customer*

## Why It Matters

The work Tangram performs provides the DoD with a rapidly reconfigurable approach and solution that makes interoperability between hardware and software capabilities a reality. Applying standardized lifecycle and testing processes along with customer-owned message transports, legacy solutions can be modified, updated and implemented at a previously unobtainable pace. With the ability to update platforms in minutes instead of weeks (estimating a cost savings of over \$50,000 per update, and a man-hour savings of 40+ hours), the Air Force can turn their focus to outpacing and outsmarting external threats, rather than overcoming integration and interoperability barriers.