

Driving the digital  
transformation of wargaming

# PIONEER™ Wargaming Solution

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BAE Systems has developed an innovative modeling and simulation System of Systems (SoS) prototype for the digital transformation of wargaming. Designed to meet the future wargaming needs of our government customers, BAE Systems' PIONEER™ wargaming solution incorporates big data algorithms, analytics, Linguistic Geometry (LG)-based explainable Artificial Intelligence (AI) machine learning (ML), and simulation into a comprehensive capability that delivers decision-making insight to military leaders.

## Next Generation Wargaming Solution

Our PIONEER wargaming solution integrates advanced AI-enabled constructive simulation engines with wargame planning, game operations, scenario analytics, user decision-making, collaboration, post-game reports, and operations analysis. The tool has a powerful modeling capability to conduct wargames at strategic, operational, and tactical levels across all domains including land, air, space, sea, undersea, and cyber.

Based on an open modular systems architecture, non-proprietary API integration framework, and innovative explainable AI and AI/ML analytics engines, PIONEER delivers an unparalleled adaptive ability to design, harvest, categorize, store, visualize, and analyze complex big data generated in the wargaming environment. The modular open architecture also facilitates component replacement or upgrades, while avoiding vendor technology lock and stagnation, and mitigating cost-escalation.

## Key Features

- Ingests authoritative data sources, including global weapons platforms and doctrinal guidance
- Simulates a comprehensive picture of U.S. and enemy weapons systems, tactics, techniques and procedures (TTP)
- Captures and analyzes data produced during the wargame execution
- Makes data available for analysis before, during and after the wargame
- Simulates a variety of mission sets and threats across all domains

## Benefits

- Rapid generation of dynamically unfolding futures permit the wargamer to grasp rather than guess the likely futures that the battle might take by directly viewing them
- Automatically generates intelligent opponents facilitating previously impossible multiple realistic "what-if" battles
- Delivers and visualizes real-time and post-game analytics using powerful LG-based explainable artificial intelligence, rigorous data analyses, and models
- Streamlines and automates pre-game preparations and post-game analysis

### DevSecOps Methodology

Compatible with U.S. Department of Defense (DoD)-approved web-browsers on thin clients, our solution was developed using distributed Agile development and DevSecOps techniques in Development, Integration/Test, and Demo environments and hosted in BAE Systems' secure Controlled Unclassified Information (CUI) cloud. By integrating cybersecurity testing within a DevSecOps methodology, PIONEER achieves DoDI 8510.01 compliance, while preparing for Authorization to Operate (ATO) for operations in Top Secret (TS)/Sensitive Compartmented Information (SCI), Special Access Programs (SAP), and Special Technical Operations (STO) environments in the future.

### User Experience

BAE Systems' PIONEER wargaming prototype delivers an unprecedented level of user experience for an automated, intelligent, and trustworthy multi-domain wargaming capability. Aligned with current doctrine and superior visualizations throughout, PIONEER features enhanced game transparency between the connected player cells to address the "fog of war," a common operating picture, interactive plans, automated decision support and easy to use reporting tools and templates.

### Our Team

BAE Systems partnered with leaders in Modeling and Simulations, explainable AI based on Linguistic Geometry (LG) as well as other types of AI/ML, Predictive Analytics and Data Analytics industry experts for its Systems of Systems (SoS) PIONEER wargaming solution. Our partners include Alex-Alternative Experts, Bohemia Interactive Simulations, CAE USA, CESI, Covan Group, PLEXSYS, Scalable Networks, Stilman Advanced Strategies, Stucan Solutions, and 4C North America.

In 2021, the U.S. Marine Corps selected BAE Systems to serve as the prime contractor for its second phase of developing and integrating a new, digitally advanced capability for the state-of-the-art Wargaming and Analysis Center at Marine Corps Base Quantico in Virginia. BAE Systems, along with its partners delivers a wargaming prototype tool to help the Marine Corps better visualize and simulate a wide range of operating environments resulting in saved lives, lower costs, and victory on the battlefield.

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