ManTech
Securing the Future

CPSTN
Invest, Innovate, Service

ManTech's Cyber-Physical Simulation Twinning eNvironment (CPSTN)

Providing A Command and Control (C2) Framework Designed for All Domain Scenarios

The United States military relies on advanced command-and-control (C2) solutions to deliver full-spectrum, all-domain capabilities that enable Multi-Domain Operations (MDO) at the speed of relevancy. Keeping pace with the industry demand for complex C2 systems, including acquisition through fielding of the framework, can be difficult. Today, ManTech's proven Cyber-Physical Simulation Twinning eNvironment (CPSTN), a fully tailorable solution, supports our customers' mission objectives to explore, develop, integrate and test complex systems.

Major CPSTN Use Cases

- Digital Twinning for System Design or System Operations
- All-Domain Mission Integration Testbed
- All-Domain Cyber Test Range

Cloud computing makes virtualization of large enterprise architectures scalable to support a variety of complex studies and phenomena. This capability enables researchers to highlight the value and benefits of inter-domain collaboration and coordination. Software-Defined Infrastructures (SDIs) provide ManTech engineers and analysts the opportunity to create, control and maintain cyber-physical environments to predict and perform

like their physical counterparts. By carefully aligning cyber simulations and physics-based reproductions, ManTech's CPSTN delivers unparalleled flexibility for our customers needing a true all-domain, hyper-realistic analytical environment and digital twin framework. The development and fielding of digital twins require an acute understanding of mission needs and timelines, and ManTech has the expertise to identify the best value options for any situation.

Discover the Innovative CPSTN Solution

Customers require a way to accelerate acquisition timelines for complex and multi-dimensional problems while improving effectiveness of products before deployment. ManTech answers that call by developing and offering a unique software solution that enables shortened acquisition times, tailored capabilities in a hyper-realistic, cyber-secure environment. Furthermore, this can all be done on a customer's platform of choice. CPSTN provides a level of customization that suits a variety of needs, and this customization is delivered via scripted deployments for convenience and reliability. Using Matlab and Python, our augmented scripting approach to deploying exceptional IT environments generates tailored visualization levels in applications like Ansys' Systems ToolkitTM, and matches the associated Command, Control, Communication, Computer and Cyber (C5) environment.

CPSTN is built to be platform-agnostic and incorporates best-of-breed, physics-based simulations and customer specific visualizations based on defined interests. Resulting simulations and models span platforms and behaviors across space, air, land, sea and cyber space . ManTech's industry leading, holistic approach combines cyber and physical models to support an unrivaled twinning environment. Our solution rapidly integrates prototype capabilities with mission-focused scenarios to meet next-generation challenges.
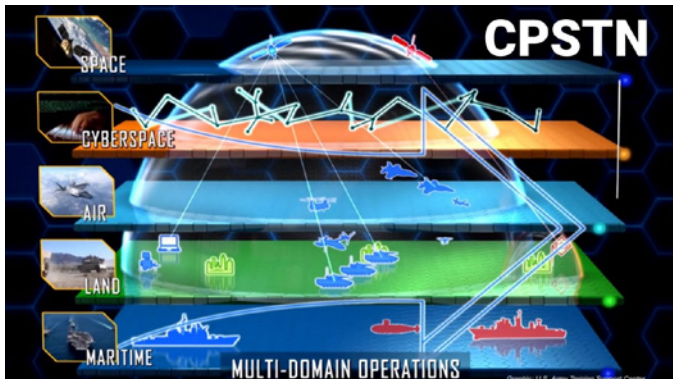
The Power of Centralized, Joint All Domain Mission Command

Centralized mission command, distributed control and decentralized execution via mission-type orders are key components of an effective Joint All Domain Operations (JADO). ManTech's use of digital twins provides the best models to support this environment with sensor information and input data to mirror activities and predict performance of physical counterparts. Because CPSTN is platform agnostic and scalable, the identical environments can effectively support field testing, operator training, infrastructure upgrades, concepts of operation development and mission-focused improvements to techniques, tactics and procedures (TTPs).

When non-commodity hardware, software or prototypes need to be incorporated into CPSTN, ManTech makes use of a communications mesh that allows for components to be virtual machine-hosted hardware-in-the-loop (HIL). CPSTN also facilitates a Universal Command-and-Control Interface (UCI) or MIL-STD-1553 messages communications service. ManTech's flexible approach delivers realistic assessments of centralized command timelines, viable options to distribute control and de-centralized mission order emulation across all domains.

Solutions to tomorrow's complex problems require industry leading information technology expertise.

CPSTN Offers

- Exact replicas of your mission architecture built with Software Defined Infrastructures (SDIs)
- Securely connected digital and physical components through encrypted communications and mature gateways
- Streamlined approach to deployment with scenario-specific IT networks and associated physics-based models via tailored scripts
- Real world communication link errors and delays that exactly emulate operational constraints
- Accurate domain contribution assessments through expert development of unique metrics for cross-domain activities and multi-domain operations

Customers want to control the cyber impacts on physical systems performance and vice-versa. By combining expert consulting services with the CPSTN capabilities, ManTech brings Digital to the Mission to "achieve the impossible."

Integration of Preferred Models Offers Tools Without Constraints

- Leverage existing tools and models to advance analysis efforts
- Integrate third party tools as white-box or black-box options to protect intellectual property
- Utilize preferred protocols or message formats to communicate with virtualized, HIL components, or software-in-the-loop models

In business more than 53 years, ManTech excels in full-spectrum cyber, data collection & analytics, enterprise IT, systems engineering and software application development solutions that support national and homeland security.

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