

DHS Science and Technology Directorate

Apex Engine: Modeling & Simulation

Context

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) launched a series of high-profile, high-impact Apex programs to look strategically at the nation's security and address future challenges while supporting today's operational needs. Apex Engines were created to meet cross-cutting needs for all Apex programs.

Impact and Vision

Through the Apex Modeling and Simulation Engine (MS-E), the most up to date modeling and simulation (M&S) know-how will be made available to Apex programs. A key focus of MS-E will be to ensure that best practices in M&S are implemented across Apex programs.

Description and Approach

MS-E identifies, prioritizes, and executes initiatives in the M&S domain required by Apex programs. MS-E provides Apex programs with domain-specific subject matter expertise (SME) pertaining to M&S tools, techniques, and trends and serves as a collaborative gateway to the wider M&S community. The MS-E team draws its knowledge from industry, academia, and government M&S resources and maintains visibility of current and emerging capabilities in the field. MS-E also maintains access to repositories of mission-based models and M&S tools. This repository allows for the categorization of models and simulation tools to ensure that organizational M&S knowledge is retained and easily accessible.

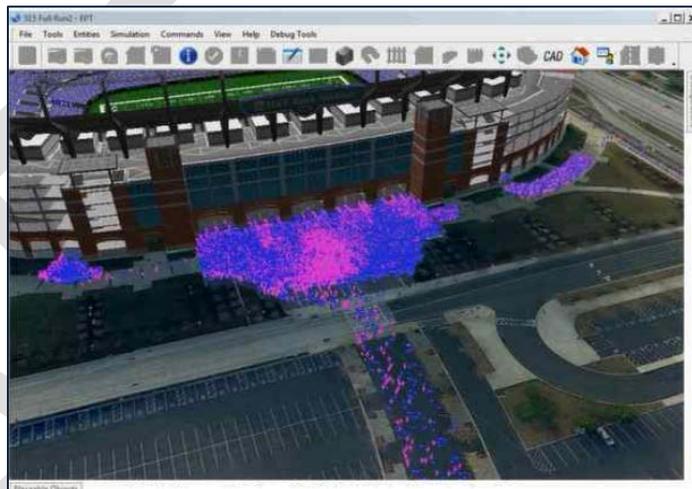
Key Activities

- Engage Apex PM's in analyzing and establishing M&S requirements and supporting Apex PM's in the appropriate application of M&S within their programs.
- Coordinate with other Apex Engines and other S&T organizations to meet Apex program needs.
- Provide M&S SME through technical assistance and/or leveraging collaborative relationships (COTS/GOTS tools, external organization expertise, etc.) to achieve Apex program missions.
- Support the development of M&S support plans and requirements forecasting.
- Provide core in-house execution capabilities through use of existing tools and resources; surge as needed to support Apex programs and other Engines.
- Maintain situational awareness of M&S trends and advancements; support industry/academia/government collaboration in the area of M&S as pertinent to DHS.
- Develop and sustain a DHS M&S repository enhancing situational awareness and collaboration.

- Establish an M&S Working Group "Community of Practice."

Requirements and Risk Analysis

As shown in the figures below, MS-E provides requirements and risk analysis (RRA) support to the Apex programs. By partnering with Apex program managers, SME's, and the user community, MS-E ensures traceability of requirements through the Apex program lifecycle and ensures technical and programmatic risks are effectively managed.



MS-E Large Crowd Evacuation Modeling and Simulation



MS-E Risk Analysis and Management Tools