STK Enterprise

The comprehensive digital mission engineering package

STK Enterprise combines all of STK's digital mission engineering software to meet the demands of organizations with multidomain projects and distributed and fractioned teams. In addition to the advanced capabilities of STK's Pro and Premium license options, STK Enterprise includes data management solutions and analysis tools for test and evaluation activities and behavior modeling.

Core Functionalities

- Private and secure system to host, process, and serve terrain, imagery, and other heterogeneous 3D geospatial data.
- Data upload, discovery, and interactivity with large 3D geospatial data sets.
- Distributable architecture for scaling and growth.
- Enhanced cross-team collaboration and sharing.
- On-premises installation options.
- Configurable identity platform options for secure access across hosted solutions.
- Automation and customization through documented APIs.

Analytical capabilities include:

- Execution of SysML behavior models in STK's mission environment.
- Streamlined workflows to support test and evaluation efforts across multidomain platforms and systems.
- High-fidelity systems modeling capabilities supporting multidomain system of systems simulations.
- Advanced trade-study tools and design optimization capabilities.
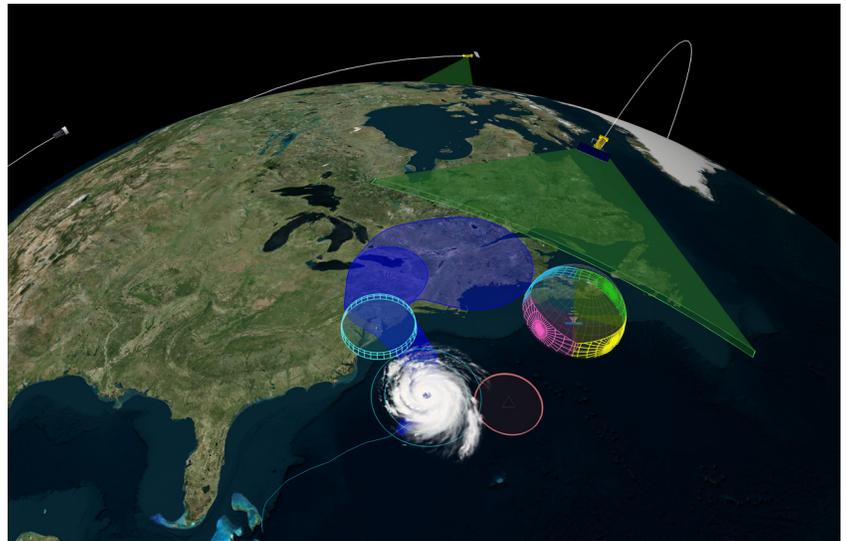
Sample Use Cases

- Enhance digital prototypes by enabling analysis and refinement of SysML behavioral models relative to their performance in a system's targeted operational environment.
- Design and test advanced multidomain systems from initial conceptual phases to mature system designs.
- Support an organization's digital transformation efforts.
- Rapid prototyping and feasibility studies.

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Behavior Execution Engine

Systems Modeling Language (SysML) is a widely used standard for defining system architectures. However, to fully validate that a SysML-based design meets its requirements, projects must execute their SysML models in a full physics-based simulation of that system's operating environment.

Behavior Execution Engine forms the bridge between SysML behavior models and the simulation environment. It establishes and evaluates correlations between transitions in SysML workflows and those same events within realistic simulations. Predict mission outcomes and assess capability performance of digitally modeled systems.


Sample Use Cases

- Analyze disparate systems behavior models in SysML.
- Include behavioral designs as part of system design trade studies.
- Assess SysML behavior designs relative to mission constraints and requirements.
- Quickly explore new operational use cases with digital prototypes.

Key Value Points

- Decrease time spent creating physics algorithms, numerical integration schemes, and additional approaches to representing environmental phenomenon.
- Eliminate cross-system simulation anomalies and ensure accurate analysis with explicit, thread-safe time orchestration across the digital operating environment.
- Coordinate the advancement of your simulation in response to time-dynamic events, not just discrete time.

Core Capabilities

- Customizable interfaces to external analysis tools.
- Simple behavior expression syntax and object-property navigation.
- Supports discrete and continuous event detection.
- Behavior trade studies using ModelCenter.
- Thoroughly documented APIs and demo reference applications.
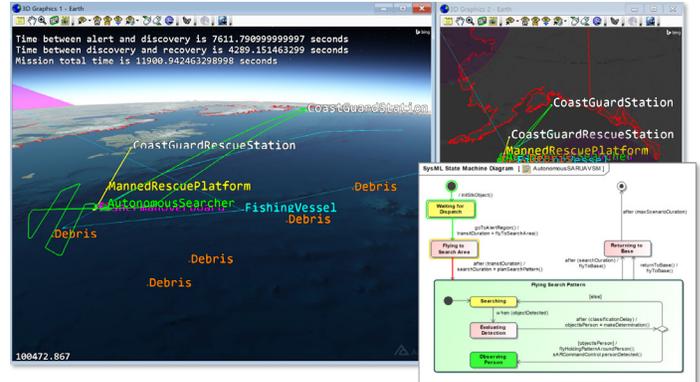
Technical Details

Execution Engine

- Ingest, interpret, instantiate, and embed formal SysML models into operational environments.

Delegate Modules

- Define 1:1 correlation between blocks in MBSE models and implementations in external analysis tools.
- Define SysML behaviors exhibited during execution, representing the influence of the operational environment.
- Integrate APIs and delegate modules with analysis tools.

Reports and Utilities

- Model Validation Report
- Element Locator
- Delegate Availability Report
- Block Usage Report
- Java Code Generator
- Runtime Code Generation
- Build, Install, and Debugging Support

Test and Evaluation Tool Kit (TETK)

STK's *Test and Evaluation Tool Kit* capability supports test event planning, execution, and post-test data analysis for improved efficiency and effectiveness of test and evaluation activities. Build and validate detailed test plans, monitor test execution, and rapidly analyze post-test results to mitigate costs and reduce retest rates. Import your own unique system data to use alongside STK data and analysis artifacts. Monitor test execution in near real-time to make better decisions faster and replan on the fly.


/ Sample Use Cases

Pre-test planning

- Predict quality of telemetry and command and control links.
- Comply with geometric, parametric, and physics-based constraints.
- Refine test point sequences and orientations to increase density.
- Define measures of effectiveness and performance.
- Coordinate temporal and spatial relationships across multiple domains.

Test execution

- Assess real-time test point attainment, enabling users to replan missions immediately.
- Monitor performance of mission systems, range assets, GIS data, and more.

Post-test analysis

- Accelerate analysis of program-unique datasets.
- Accelerate anomaly forensics.
- Fuse data from onboard systems, payloads, data links, and range sensors.
- Perform track-to-truth matching and validate sensor performance.
- Assess test results relative to specifications.
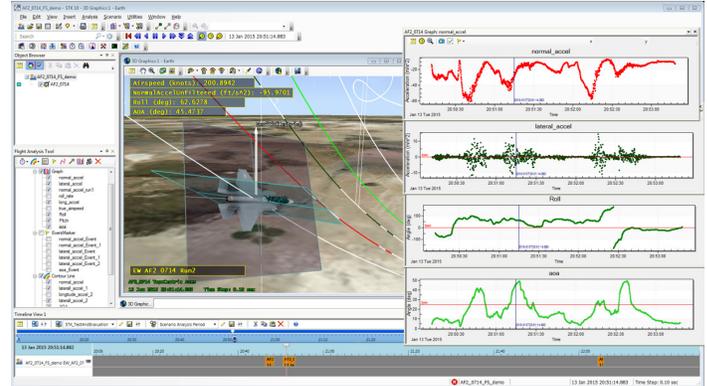
/ Key Value Points

- Maximize test point density and reduce retest rates.
- Process data quickly to enable immediate mission insights.
- Accelerate test performance assessments.
- Fuse data from onboard systems, data links, and range sensors.
- Save money by enabling the retesting of failed points before the test sequence ends.
- Gain insight into technical details through 3D visuals, reports, and graphs.

/ Core Capabilities

- Automate the import of custom data sets.
- Visualize techniques for complex data relationships.
- Automate workflows to perform common test and evaluation analyses.
- Display relevant data to a particular time window and analysis objective.

/ Workflow Tracking

- Track-to-truth comparison with a workflow that calculates geometric verification measures.
- Automation workflow with automation of steps to ingest and analyze sensor tracks.
- Events workflow with automation of radar queueing in conjunction with weapons events.
- Sensor volumes workflow and visualize behavior of data-driven sensor volume.
- EW and ID workflow, filtering sensor tracks based on electronic warfare characteristics.
- Measurements filtering and analysis.

Geospatial Content Server (GCS)

Geospatial Content Server (GCS) provides a comprehensive solution for hosting and serving high resolution terrain, imagery, and other heterogenous 3D data sets such as building data and complex 3D models. Geospatial Content Server uses a web-first streaming mechanism designed for efficient delivery of massive geospatial data sets to STK — and other tools — for visualization and analysis.

Sample Use Cases

- Privately host processed and curated imagery and map data safely and efficiently within firewalled private networks.
- Process and host high-fidelity terrain and 3D Tiles ready for use in STK's digital mission simulation environment.

Key Value Points

- Supports modern security protocols such as OAuth 2.0, OpenID Connect, and SAML 2.0.
- Built-in identity management system.
- Integration with standard identity providers.
- Accessible from any standard browser.
- Interactive 3D assembly and exploration of geospatial content.
- Supports multiple terrain, imagery, and vector data formats.
- Supports 3D Tiles —an open specification for streaming massive heterogeneous 3D geospatial datasets.

Core Capabilities

Distributable Architecture

- Supports scaling to meet enterprise needs.
- Supports more users as usage grows.

Terrain Processing

- Simplified level-of-detail pyramid.
- Client applications can precisely request terrain tiles when the data is not visually discernible.
- Adaptive level of detail; at the root zoom level, meshes are simplified until roughly 150km in error from original source data.
- Through use of an irregular mesh for terrain geometry, merging data sources of different resolutions does not require all geometry to be up sampled to the maximum resolution.
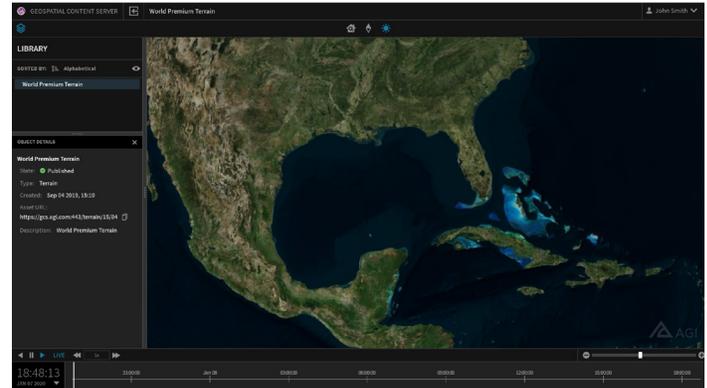
Terrain Hosting

- Uses open standards terrain runtime format, Quantized Mesh, to avoid vendor lock.
- Efficient storage on server through stand-alone database files processed from terrain tile sets.
- Removal of file system clutter by embedding tiles within a database rather than direct storage to the file system.
- Optimization of file management transfers between hosting nodes.
- Designed for processing on dedicated computers, yet easily imported into lightweight hosting nodes.

Prepopulated with Rich 3D Geospatial Content

- Includes various-resolution global terrain data sets, 10-meter resolution global Sentinel-2 imagery, and 3D models in standard formats.

Terrain Data

Source	Coverage	Resolution
USGS GTOPO30	Entire Earth	1000 meters
CGIAR SRTM	60N -60S	90 meters
USGS National Elevation Dataset (NED)	United States	30 meters
USGS GTOPO30	Entire Earth	1000 meters
USGS CGIAR SRTM	60N - 60S	90 meters
USGS National Elevation Dataset (NED)	Continental U.S. and Alaska	10 meters
USGS National Elevation Dataset (NED)	North America	30 meters
USGS SRTM 1 arc sec	60N - 60S	30 meters
EU-DEM	Europe	30 meters

Imagery Data

Source	Coverage	Resolution
Sentinel-2 2019	56S – 84N	10 meters

"Pre-processed" Formats:

Format	3D model	Imagery	Terrain	Vector
3D Tiles	X			
Tile Map Service (TMS)		X		
Terrain Database			X	
CZML				X

Formats that require processing:

Format	3D model	Imagery	Terrain	Vector
CityGML	X			
NITF		X		
GeoTIFF		X	X	
USGS ASCII DEM, CDED, DTED, HRE, FLT, HGT, BIL, BIP, BSQ			X	