

# SoSAT

## System-of-Systems Analysis Toolset

### Highlights

#### What does SoSAT Enable?

- A unique approach to SoS analysis
- Multiple user-definable performance metrics
- Modeling system interdependencies and shared functionality
- Performance measurements of functionally interdependent SoS
- SoS trade study modeling, analysis, and performance assessment
- Reliability and functional availability analysis

#### Why is SoSAT Important?

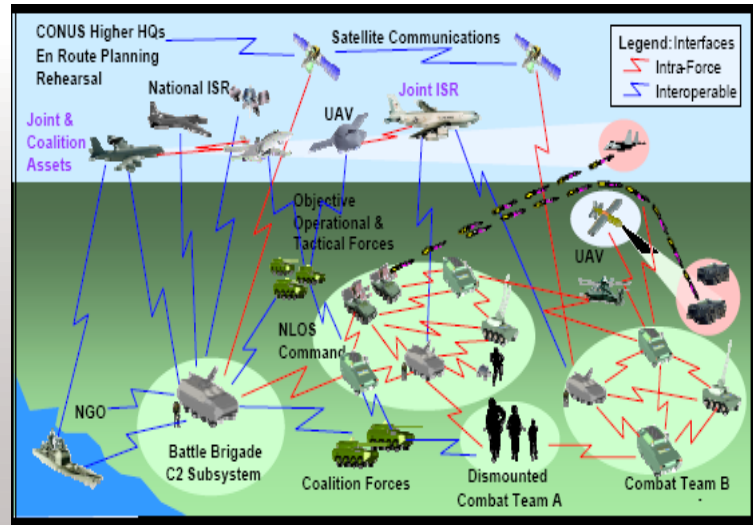
- Characterizes large-scale interdisciplinary problems that involve multiple distributed systems embedded in networks at multiple levels and in multiple domains
- Allows analysts to evaluate the readiness and sustainment of complex SoS
- Assists analysts in identifying non-intuitive, interdependent performance and logistics issues

#### Example Applications

- Operation and support cost analysis
- Footprint reduction and impact analysis
- Evaluation of energy efficiency improvements
- Modernization upgrade impact analysis
- Sustainment assessment
- Acquisition decisions
- Vulnerability analysis

### SoSAT Overview

SoSAT is a tool designed to model and simulate multi-echelon operations and support activities of a system-of-systems (SoS). It provides logistics analysts with the ability to define operational and support environments of a SoS, ascertain measures of platform and SoS-level performance effectiveness, and determine logistics support issues. As a stochastic simulation, SoSAT characterizes sensitivity changes to all platforms, support systems, processes, and decision rules as well as platform reliability and maintainability (R&M) properties. It is designed to be a robust decision support tool for evaluating readiness and sustainment of systems, including consumables and maintenance operations. SoSAT is applicable in diverse industries such as defense, energy, aviation, and healthcare.



# SoSAT

## Key Features

### Provides Analysts the Capability to:

- Simulate any SoS organizational structure
- Capture multiple system functionalities at any given time
- Assess multiple performance metrics of multiple systems at multiple levels of an organizational structure over time
- Support business decisions and trade-offs

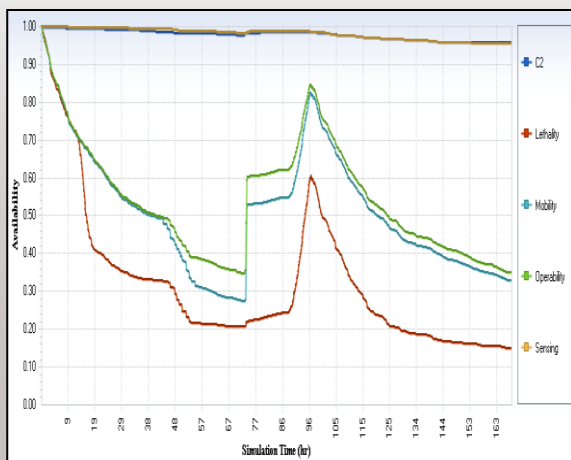
### Stochastic Simulation

- Can model variability and uncertainty among various types of systems, individual instances of a system type, and from trial to trial

### Advanced Data Visualization

- Real-time status of individual systems and their components
- Detailed information for all systems in the model provided at the individual system level, system type level, and organizational structure level
- Customizable results display with selectable amount and type of data for finer control of the output

Functional Availability vs. Time



## Key Benefits

### Basic Modeling Features

- System element reliability failures
- Consumable usage, depletion, and generation
- Maintenance activities including required spares or services
- Supply reorder for consumables and spare inventories

### Advanced Modeling Features

- Combat damage modeling
- Network modeling
- Prognostics and health management
- Time-based changes to model attributes due to external conditions
- Human performance modeling

### System State Model

- Encapsulates a system, its elements, and its functionality for use in the simulation
- User definable with multiple functions, components, failure modes, personnel, or functional elements of other system
- Describes a system's functionality by the states of the system's elements

**System State Model**

**NLOS-C Model**



Example Elements	Example Functionality
•105 mm Cannon	- Operability
•M240 Machine Gun	- Lethality
•Sandstorm	- Mobility



## Contact Us

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