

# MODELING THE EFFECTS OF NET-CENTRICITY IN A CONSTRUCTIVE OPERATIONAL ENVIRONMENT

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# Objective

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- Describe a simulation “test-bed” for measuring the effectiveness of individual systems in a larger Netcentric “SoS” context,
- Topics of discussions,
  - Littoral Combat Ship Mission,
  - Modeling Environment,
  - System Functionality,
  - Throughput Manager,
  - Performance Measurements.

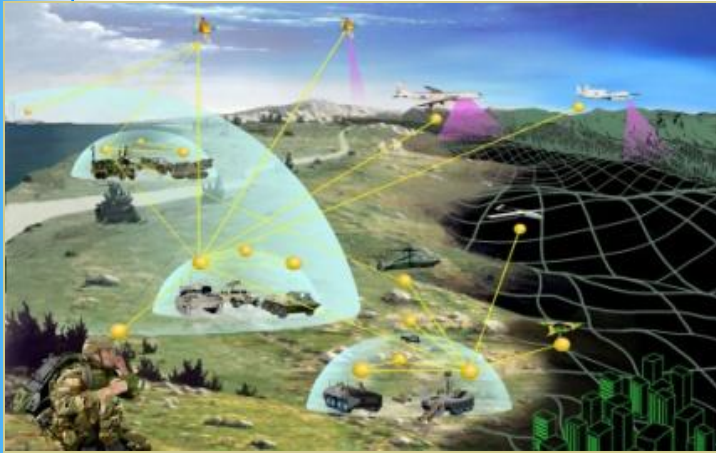
# “SoS” Concept of Operations



## Littoral Combat Ship (LCS) Description

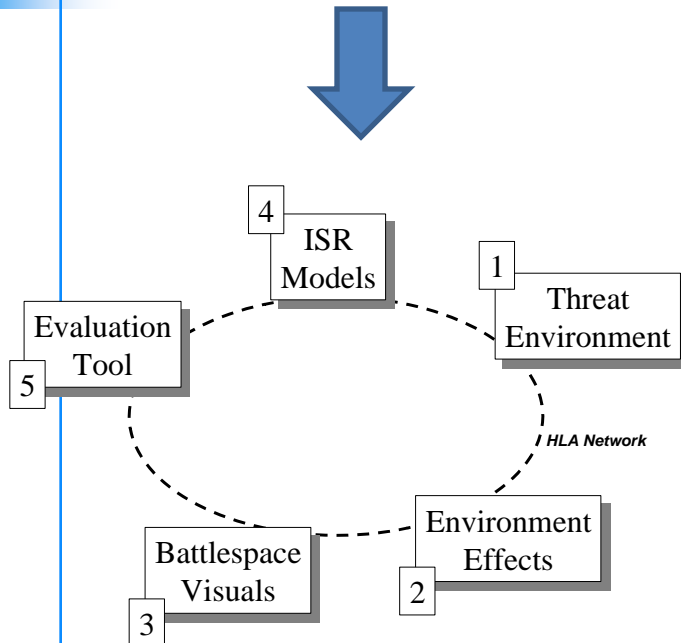
- Optimized for warfighting in the littorals
- Reconfigurable single-mission focus
  - Surface Warfare (SUW)
  - Mine Countermeasures (MCM)
  - Anti Submarine Warfare (ASW)
- Modular open systems architecture
- Fully netted with the battle force

# Modeling Environment

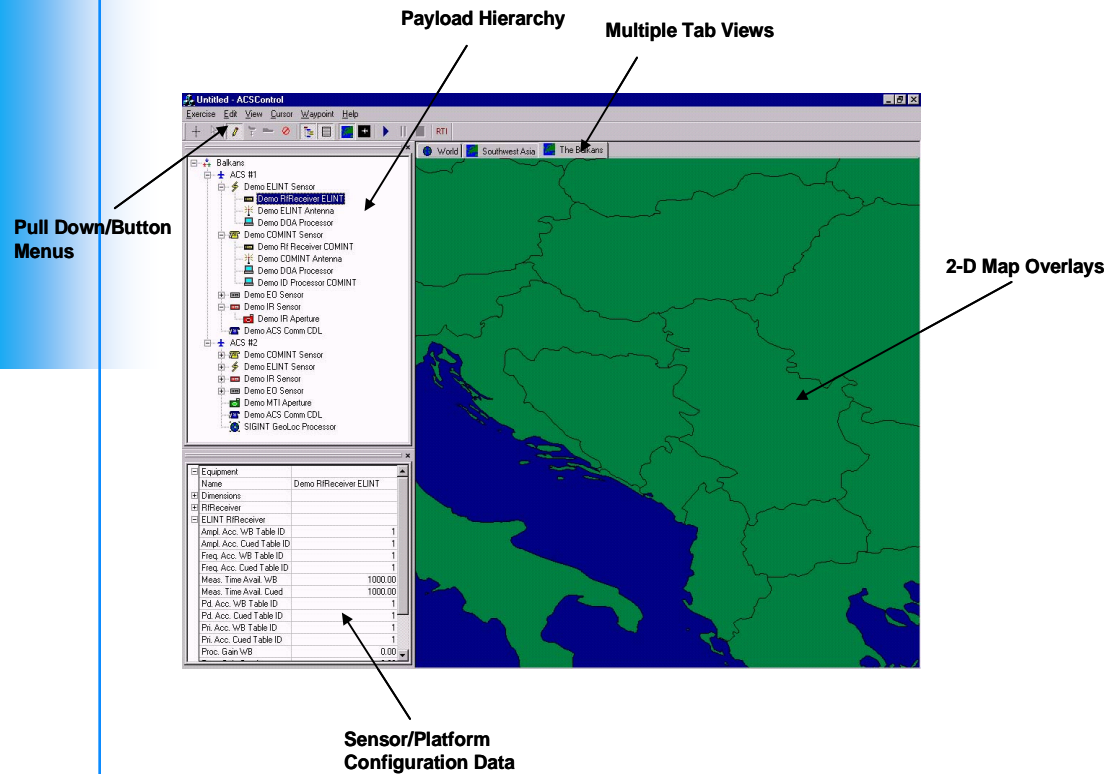


## 5 basic components:

- Threat Environment: provides internal ground truth threat scenarios
- Environment Effects: provides environment degradation effects to RF and Imagery sensors
- Battlespace Visuals: provides visual for scenario in 2D/3D
- ISR/Other Models: tasking, collections, processing, exploitation, dissemination (TCPED), communications, throughput, and vehicle dynamics
- Evaluation Tools: provides evaluation/analysis of sensor packages and scenarios



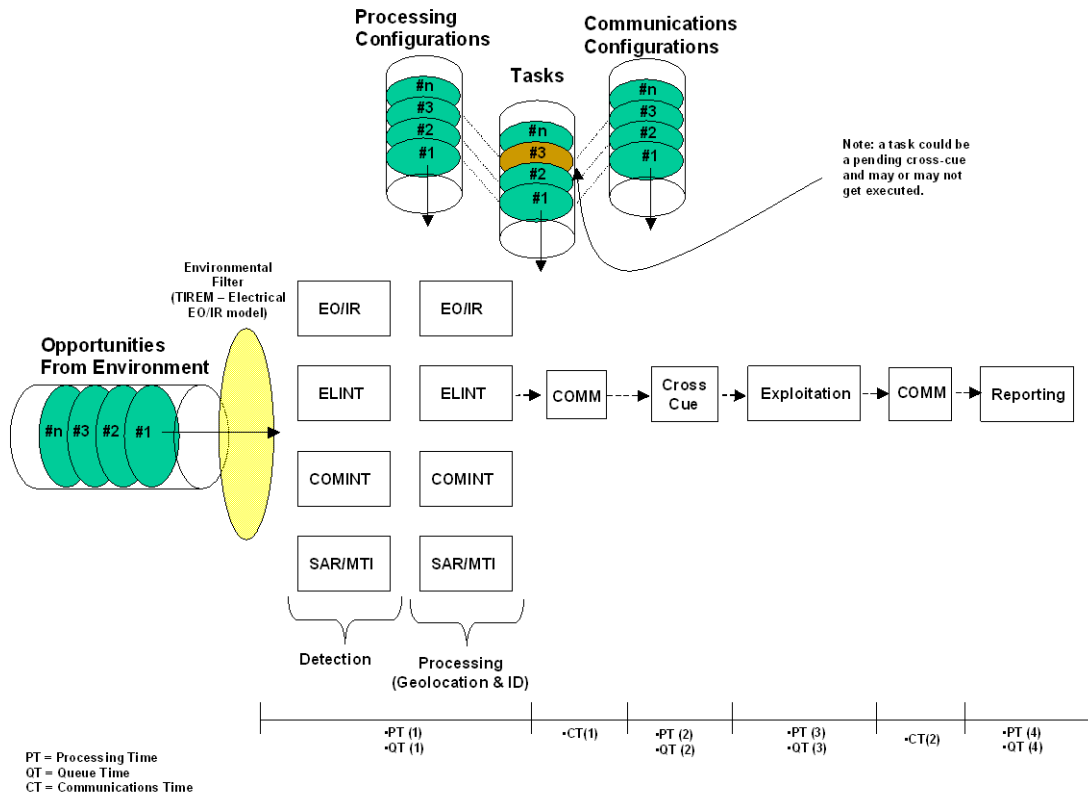
# System Functionality



## Operational Model System Functionalities:

- User interface to provide mission planning/tasking
- Reconfigurable sensor and communication linkages
- Resource allocation of sensor assets
- Performance assessments

# Throughput Manager



## Throughput System Functionalities:

- Provide accurate timeline and latency range estimates
  - Processing workloads
  - Communication links
- Monitor current task to build a timing chain for each data type
- Monitor for cross-cue events

# Performance Measurements

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- **System to Detect Targets**
  - An opportunity becomes relevant when the target is part of the mission tasking
- **System to Locate Targets**
  - Reported as an estimated lat/lon with 50%, 75%, 90%, 95% EEPs
- **System to Classify, Recognize, and Identify**
  - Tracked vs. wheeled, tank vs. APC, T-72 vs. M1A1
- **Throughput Capability**
  - Provide statistics on the number of targets processed vs. targets waiting to be processed per unit time
- **Reporting**
  - Provide projected number and size of report, and timeliness

# M&S Utilization and Benefits

- **Parametrically modeled components and systems**
  - Air platforms, SAR/MTI, EO/IR, SIGINT (COMINT, ELINT), Acoustics
  - Single platform systems and processing
  - Multi-platform System of Systems (SoS)
- **Utilization highlights**
  - System performance assessment in an relevant operational scenario
  - Cooperative engagement scenario assessments
    - LCS and UAV cooperative missions
  - Sensor to emitter/vehicle mapping performance analysis
- **Benefits**
  - Effective method for early system design performance trades
  - Identified most effective LCS+UAV CONOPS
  - Identified gaps in sensor design/performance objectives