Executable Architecture Methodology for Analysis

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Army-Contract MOIE

MITRE Technology Program

Problem

- Most current information technology (IT) architecture products are ***static*** representations.
  - We lack means to conduct a proper dynamic analysis of the IT system's capabilities, behavior and performance in its operational environment over time.
  - We need a methodology to conduct dynamic analysis.

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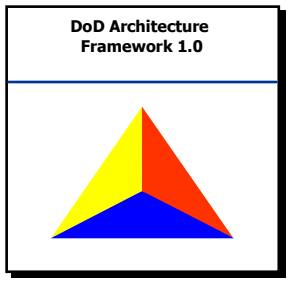
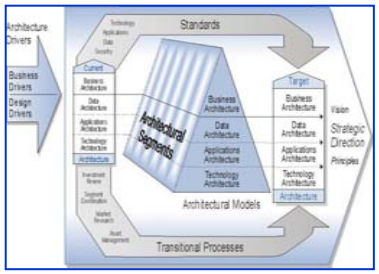
Background

Treasury Enterprise Architecture Framework (TEAF)



DoD Architecture Framework



Federal Enterprise Architecture Framework (FEAF)

- The Clinger-Cohen Act mandates the use of architectures to document IT acquisition requirements.

- DoD and other federal agencies have developed architecture frameworks to meet this requirement.

- Each framework defines numerous static products (graphical, textual, and tabular) to capture specific architectural descriptions.

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Objective

- The project will develop a methodology to support the dynamic analysis of a DoD IT system using executable architectures.
- We will integrate an executable operational architecture model of processes and organizations with an executable communications architecture model and a combat simulation to provide a dynamic analytical environment for measuring system performance and effectiveness.

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Activities

- Review modeling tools and develop a methodology to dynamically analyze architectures
- Create a prototype tool to implement the methodology to convert architectural specifications into executable representations
- Develop a network and communication system architecture
- Establish a federated simulation environment with associated executable specifications, and evaluate the methodology using a practical application

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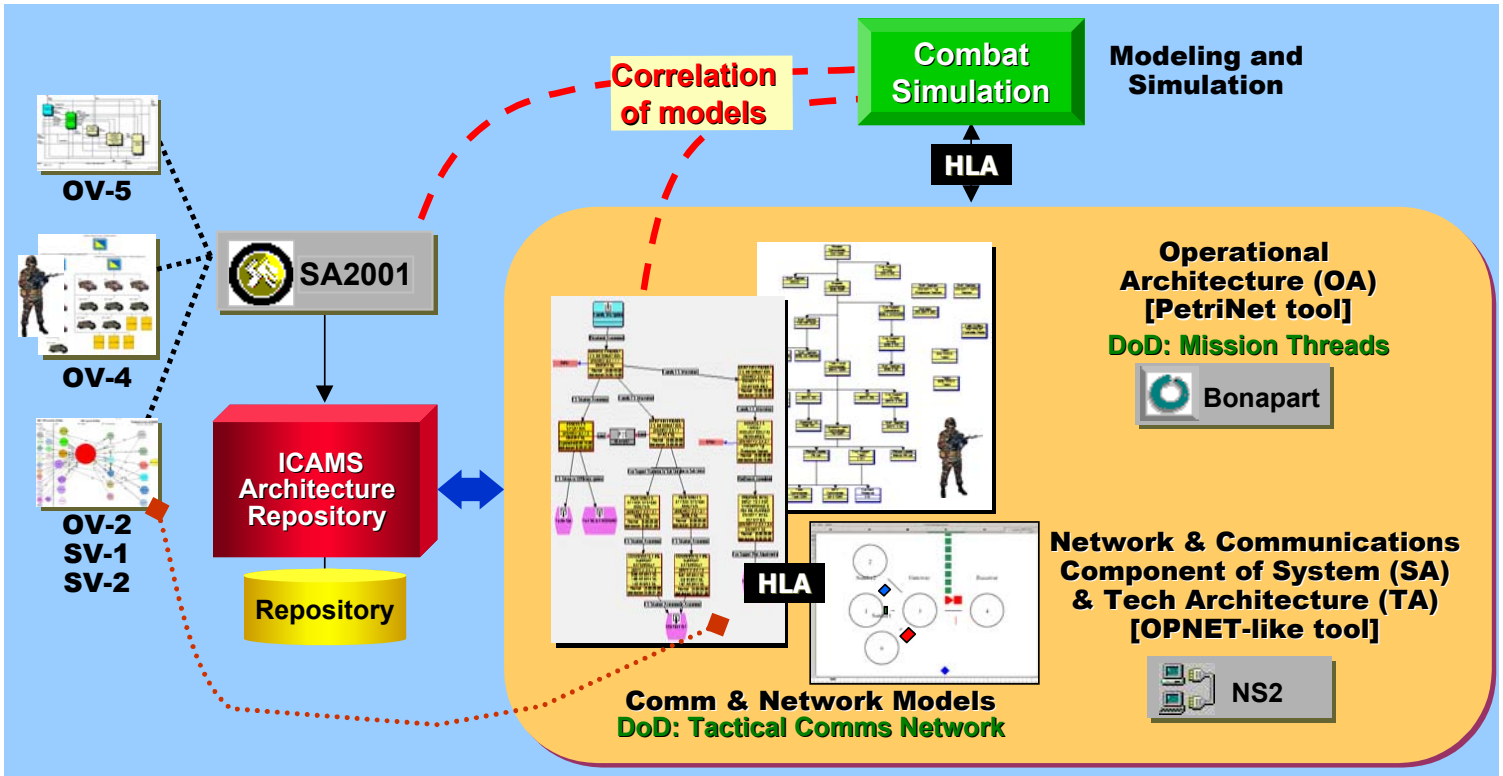
Highlight



- Address Transformation and Modernization issues
  - ✓ Establish federated simulation tool environment for dynamic architecture development and analysis (HLA)
  - ✓ Examine ability of communication network architecture to support an OA
  - ✓ Measure overall process performance against different combat mission scenarios

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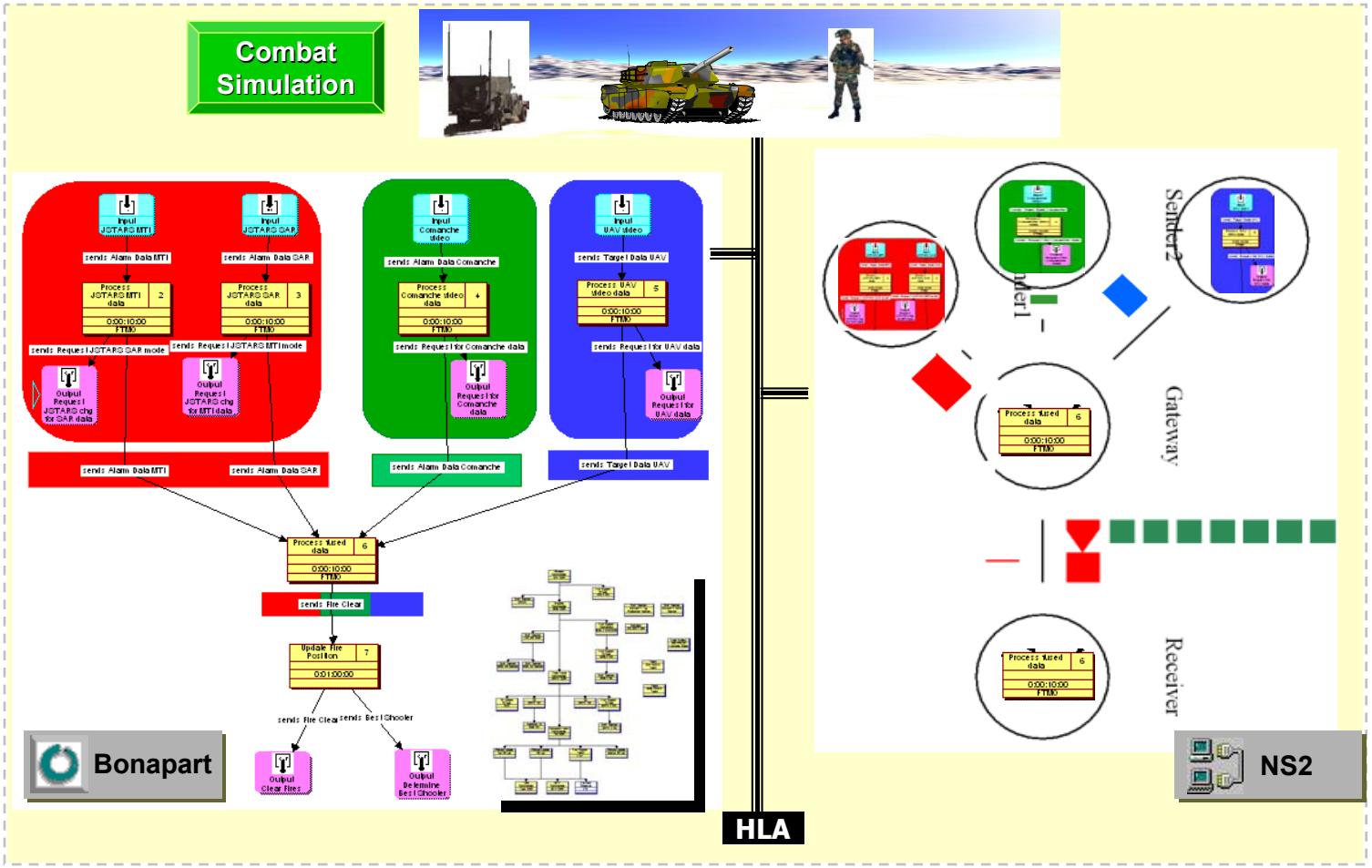
Demonstration



Impacts

- **Supports MITRE's DoD sponsors**
  - Provides capability to develop and analyze DoD C4ISR architectures and adapt them easily to changes
- **Supports Simulation-Based Acquisition (SBA)**
  - Facilitates ability to dynamically explore multiple alternative solutions
- **Supports DoD and Federal Architecture Communities**
  - Provides universally applicable methodology for dynamic analysis
  - Steers architecture efforts to more rigorous methodologies supporting both static and dynamic analysis

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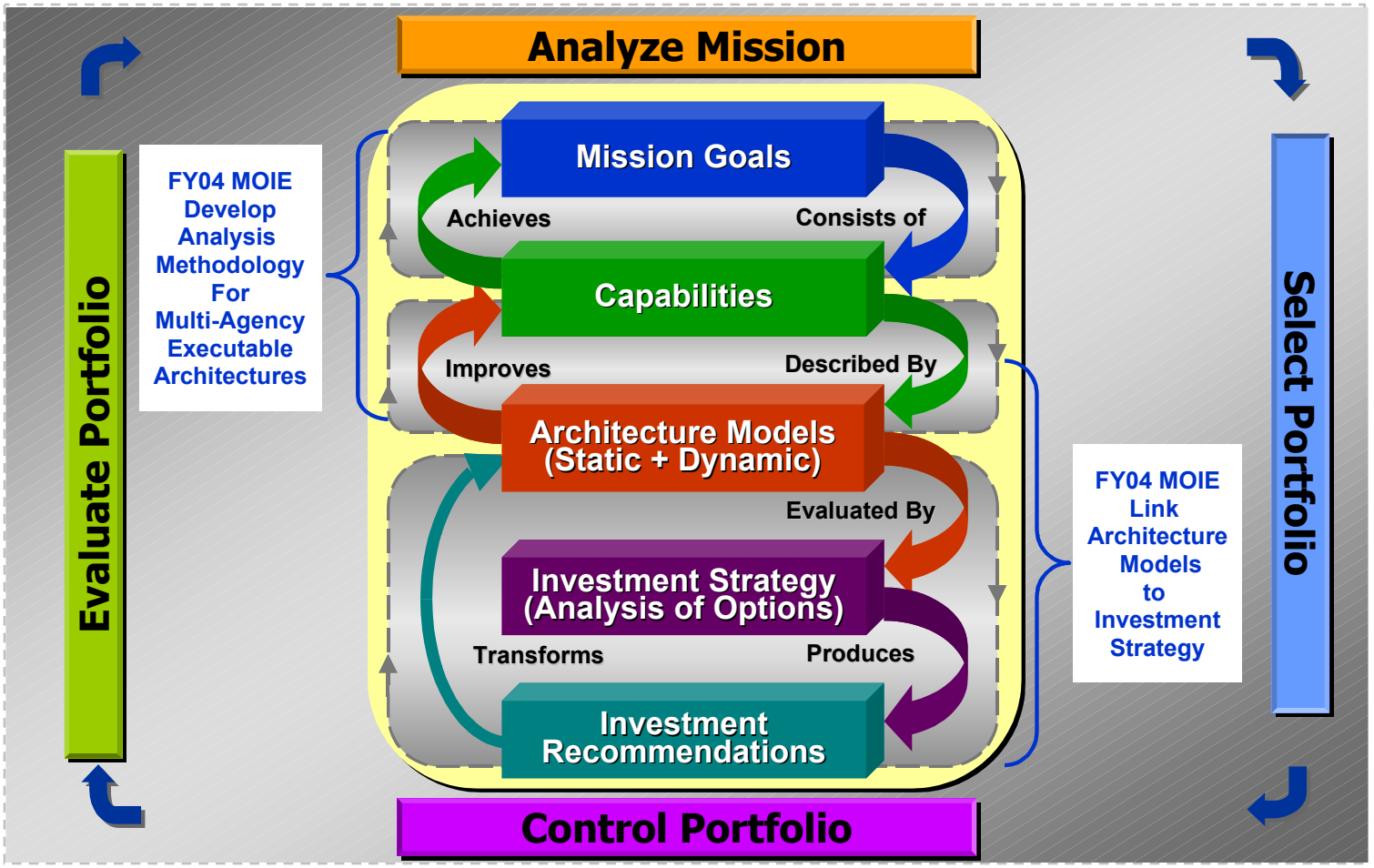
Future Plans



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