

# OneSAF as an In-Stride Mission Command Asset



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# Agenda



- OneSAF Introduction
- Mission Command Asset Capability Needs
- Program Survey and Findings
  - DARPA Deep Green Program
  - Army Modeling and Simulation Office (AMSO) and SIMCI Standards-Based simulation initialization from Mission Command Projects
  - NATO Modeling and Simulation Group 085 Simulation and C2 Interoperability Effort
- OneSAF Support
- Conclusions





# OneSAF Introduction



## Objectives

- MNS: Reduce Army Life Cycle M&S costs
- ORD: Capable of replacing USA legacy entity based simulations: BBS, OTB / ModSAF, CCTT / AVCATT SAF, Janus (A&T), JCATS MOUT

## Users

- RDECs / Battle Labs / Active Duty Brigades & Battalions
- Service / Joint Organizations
- International Partners
- USG Contractors / Academia

## Programmatics

- MNS: May 97
- PM Charter: May 00
- ORD V1.1: Aug 04
- V1.0 (FOC): Sep 06
- ACAT II: Nov 09
- V5.5: Jul 12

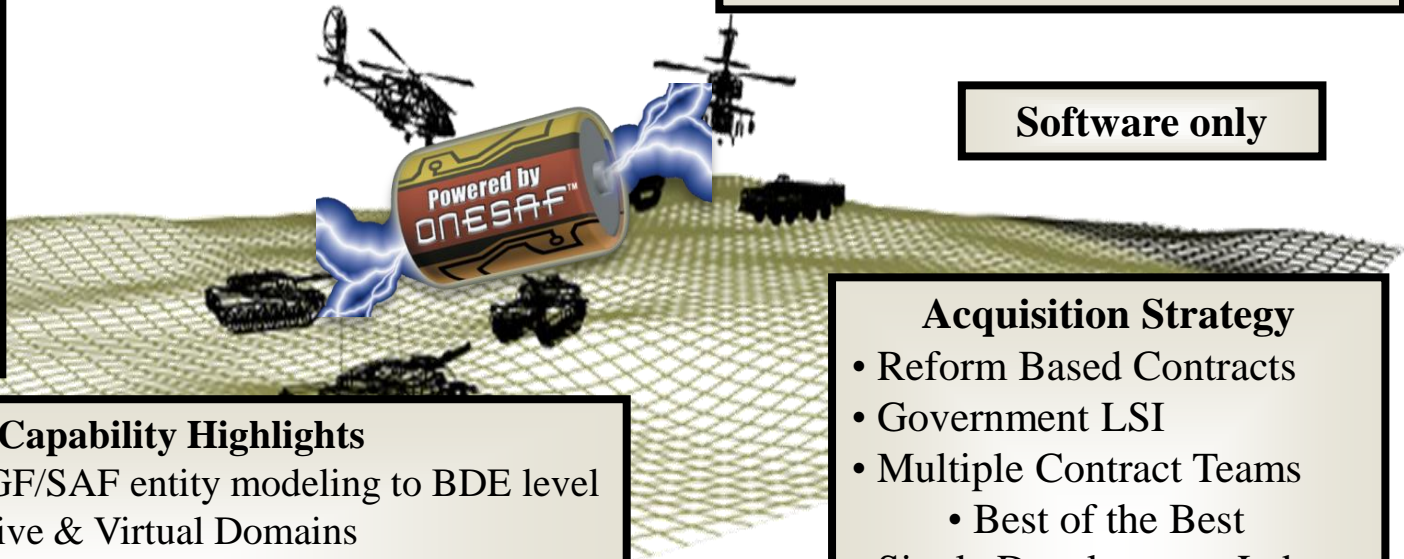
Software only

## Technical Capability Highlights

- Provides composable CGF/SAF entity modeling to BDE level
- Supports both Constructive & Virtual Domains
- Provides Urban Operation modeling with COE Focus
- Provides Scenario Generation thru AAR Operations
- Provides DIS/HLA/JC3IEDM/ABCS Interoperability
- Supports ACR, RDA, TEMO Domain applications
- Platform independent (Linux/Windows) software

## Acquisition Strategy

- Reform Based Contracts
- Government LSI
- Multiple Contract Teams
  - Best of the Best
- Single Development Lab
- Source Code Provider
  - Linux Paradigm
- Agile SW Development
- Standards Based SW





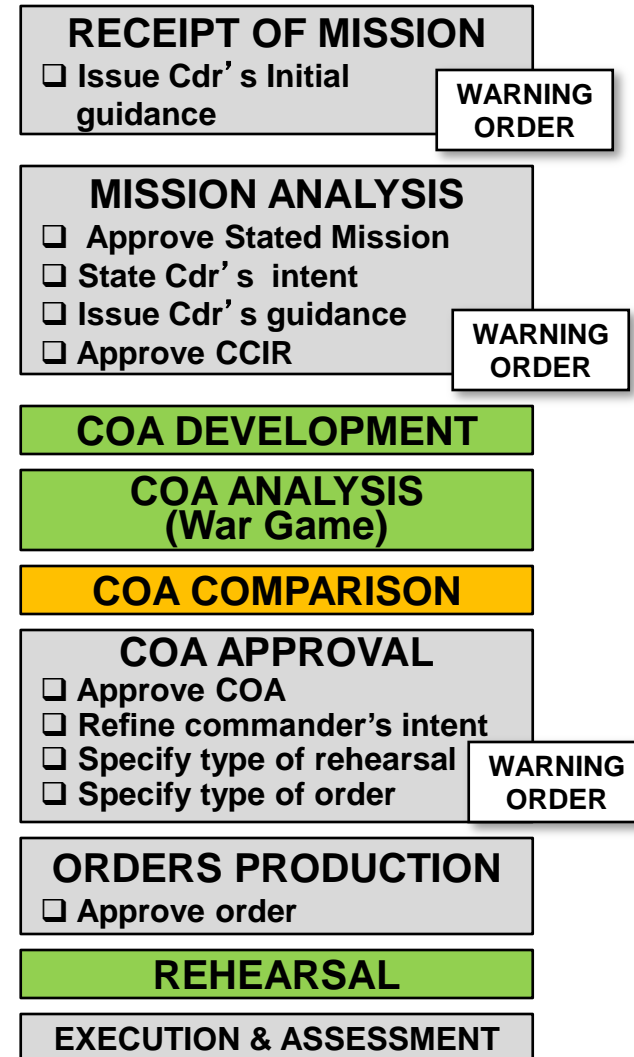
# Mission Command Capability Needs



## The Network enabled Mission Command (NeMC) Initial Capabilities Document requirement for simulations:

- Course of Action (COA) Development;
- Analysis;
- Running Estimates;
- Mission Rehearsal; and to
- Support of After Action Review

Military Decision Making Process





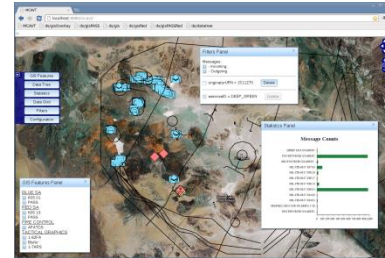
# Simulation Supported Course of Action Analysis



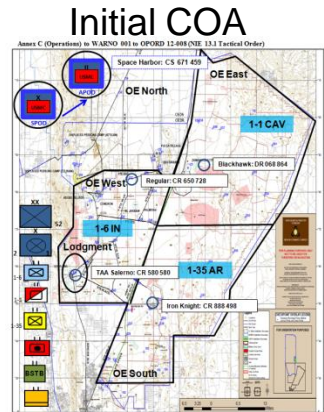
COA Execution via  
DVR, 3D Map, Video  
Widgets



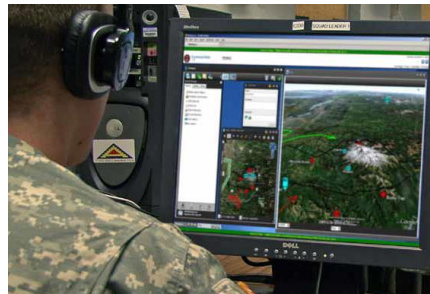
COA Decision Point  
for Checkpointing



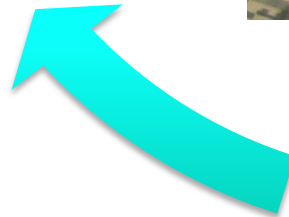
COA Laydown  
via Command Web  
Widgets



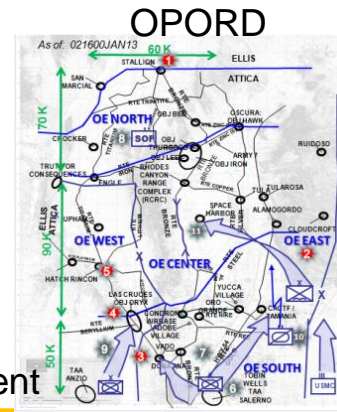
ISR Recon & Seize Obj



COA Laydown &  
Refinement  
Via Live Feed  
(DDS/C2I) using  
Planning Widget



COA Analysis via MC  
Visualization Tool



Move to  
Mission Rehearsal,  
Execution & Assessment





# Simulation Services in a Command Post



## Future Operational Capabilities:

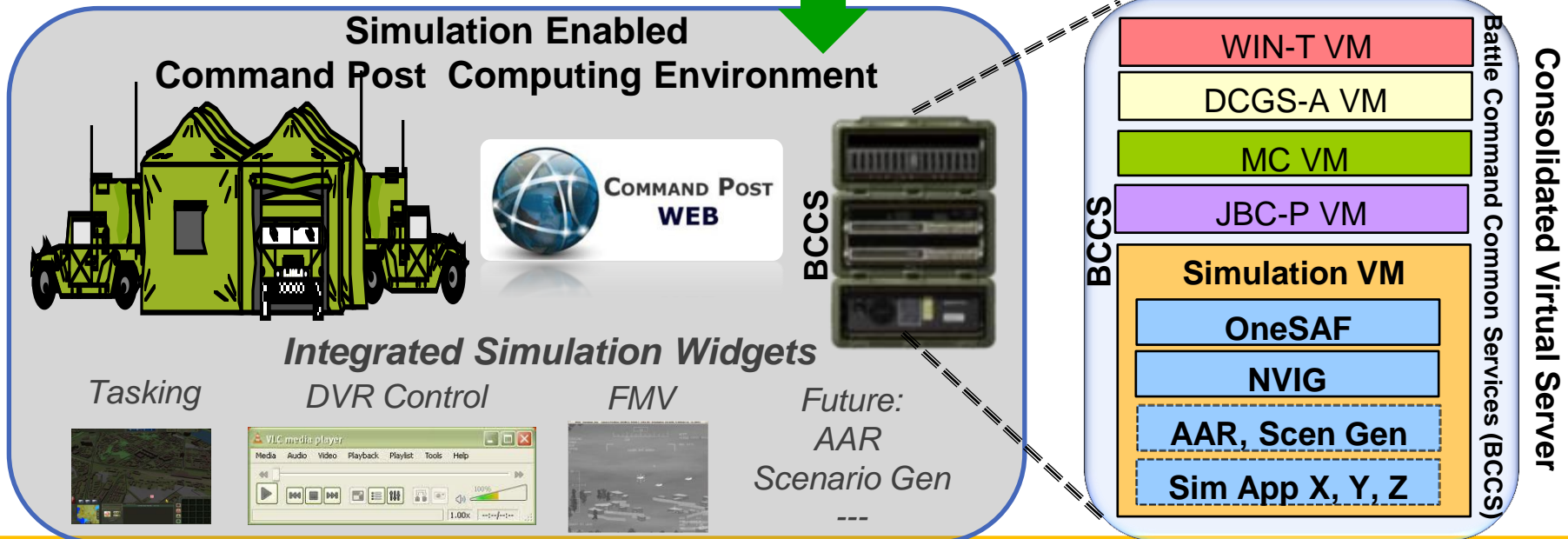
- ✓ Mission Planning/Rehearsal
- ✓ COA Analysis/Wargaming
- ✓ Deployed Staff Training
- ✓ Running Estimates
- ✓ AARs
- ✓ Extensible to Mounted/HH CE (i.e. route planning, radar/sensor emplacement, etc)



## Technical Highlights:

- ✓ Leverage PORs
- ✓ Employ standards
- ✓ Virtualized applications
- ✓ Reduced HW/SW footprint
- ✓ Infrastructure reuse
- ✓ Native MC user widget interfaces (3D Map, etc)
- ✓ Sim background service

**Embedded, Standards-Based M&S – MC Interoperability**



# Program Survey and Findings

Deep Green

AMSO-SIMCI

NATO MSG-085



# DARPA Deep Green Overview



- DARPA Project to provide leap-ahead C2 Mission Planning and Execution Capabilities
- 2008-2011 OneSAF participation as a test-harness providing the operational context to drive the Deep Green capabilities







# Deep Green Mission Planning and Execution

## Key Insights

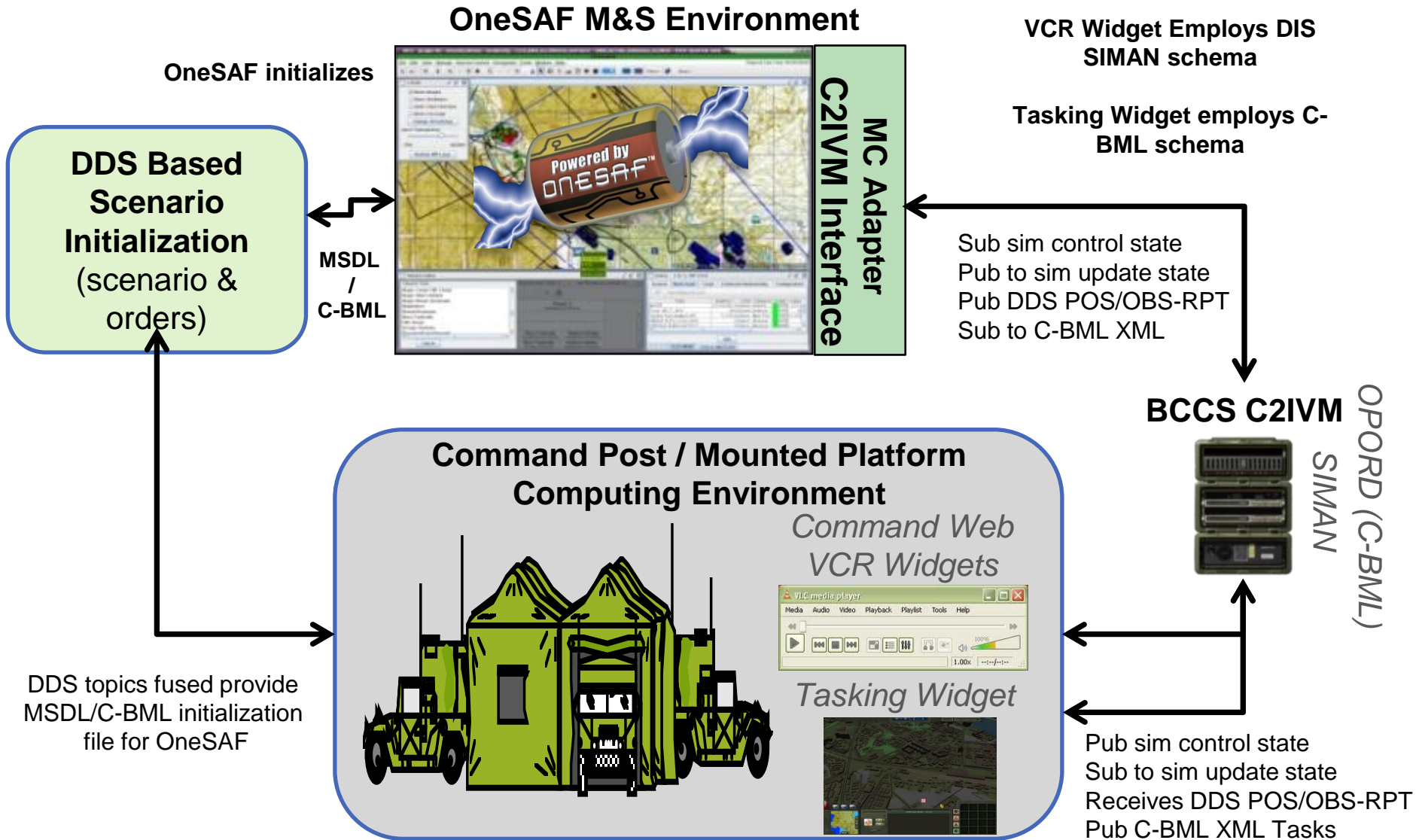


- **Identified Needs and Findings:**
  - Fully automated behaviors that are initiated based on command level orders;
  - Faster than real-time execution to support the timelines associated with mission planning cycles;
  - Setup, execution, and control must be transparent to the operational user;
  - Use Mission Command data as simulation start data;
  - Availability of user selectable branch points;
  - Availability of Command level selectable optimization criteria;
  - Availability of command selectable reporting and running estimate;
  - Availability of plan and actual execution data comparison reports;
  - Easily separable simulation and real-world data;
  - Automated OPFOR initialization and behavior representations; and
  - Availability of a broad range of warfighting functional area representations.





# AMSO-SIMCI Projects Overview





# AMSO-SIMCI Mission Planning and Execution Key Insights



- **Identified Needs and Findings:**

- Leveraging simulation and MC standards eases integration and reduces development time;
- Reusing and extending existing simulation and MC infrastructure and tools reduces development costs and testing time;
- Existing MC data from The Publish and Subscribe Service (PASS)/DDS, Command and Control Registry (C2R) and other infrastructure assets provides viable and feasible BLUFOR and OPFOR data for simulation initialization;
- Providing tools to easily identify and control simulation data vice real-world data is a current gap that must be addressed. It should be noted that data fields do exist to identify simulation vice real-world data but the data fields are not handled consistently across MC systems;
- Support of web-enabled technologies are critical to allow simulation control within existing MC applications;

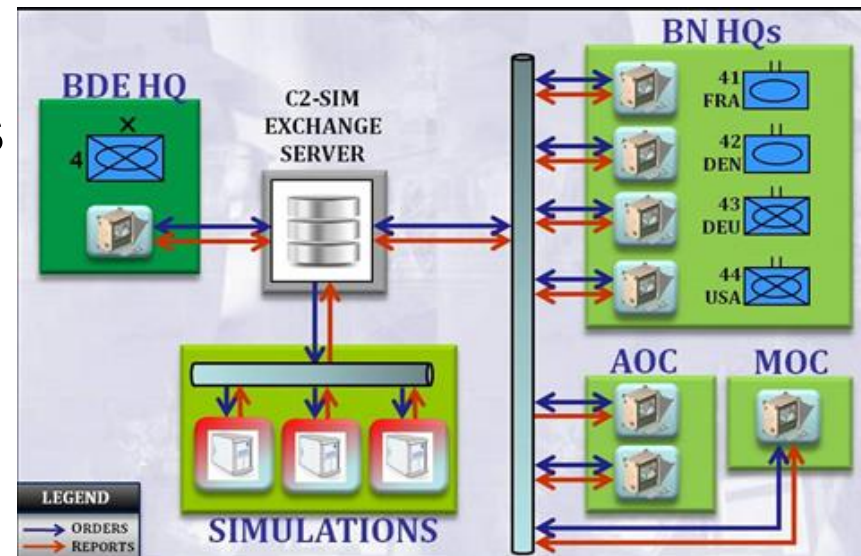




# NATO MSG-085 Overview

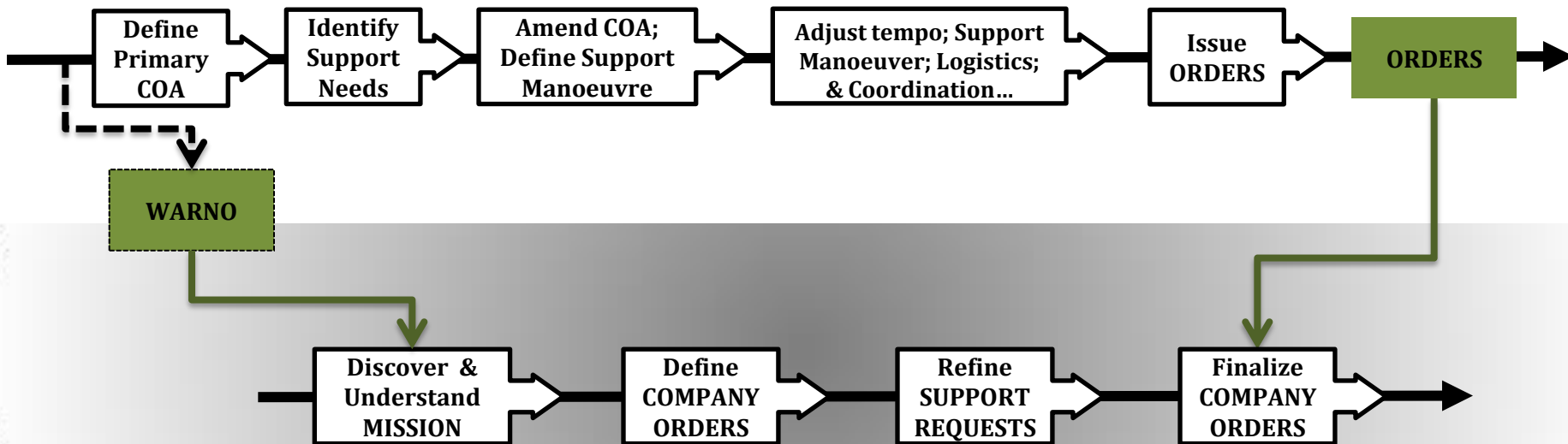


- 12 Nations Focused on employing and assessing simulation standards to support operational C2 and simulation use
- 2011-2013 with 1 year extension for final report completion
- Series of demonstrations across 2011-2014 showing distributed simulation to C2 capability supporting the Mission Planning process





# Joint & Combined Mission Planning Process

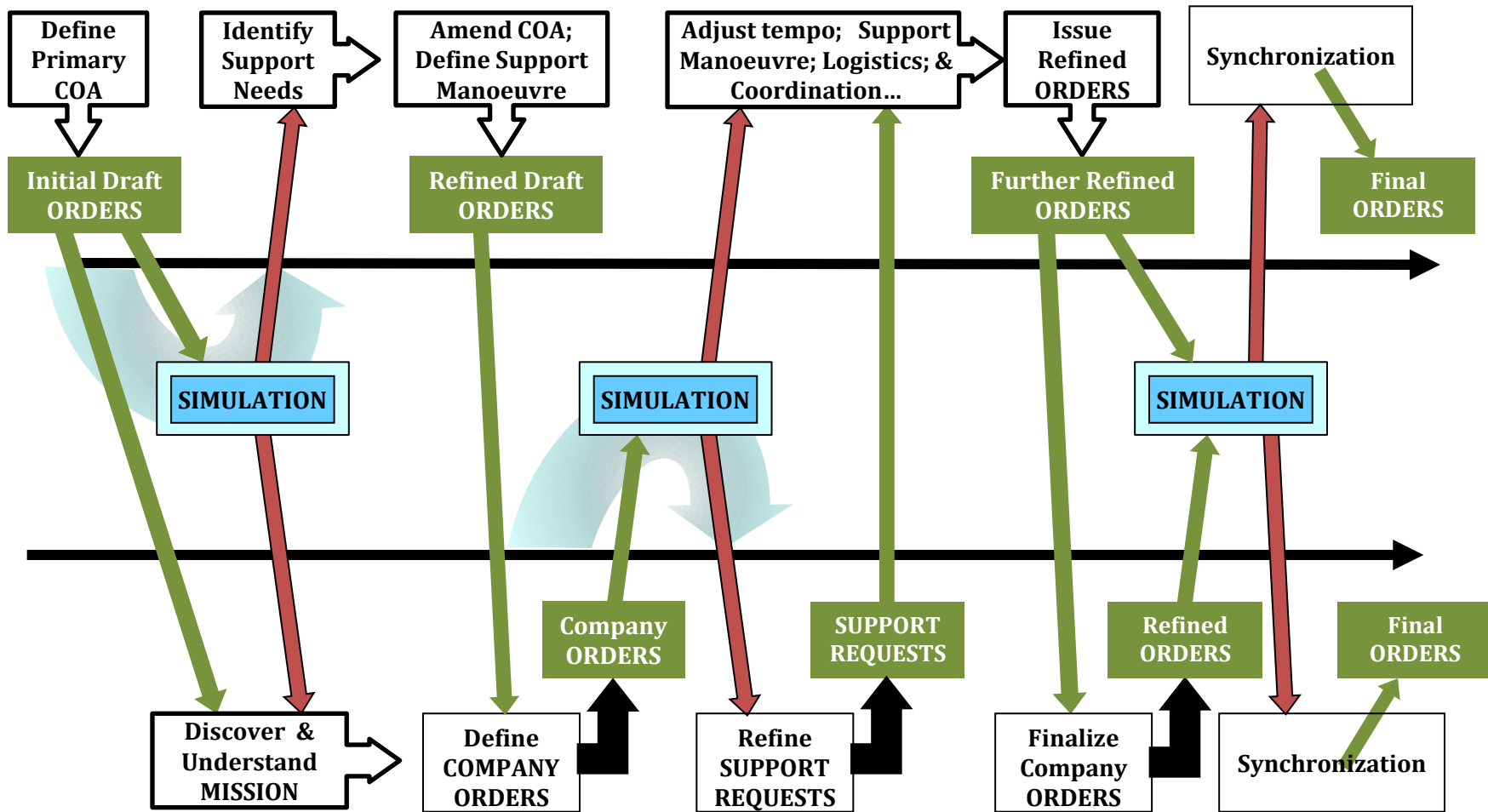


*Current process is essentially a linear, parallel process...*





# Simulation enhanced Joint & Combined Mission Planning Process



## Briefing

## Back-briefing

## Synchronization

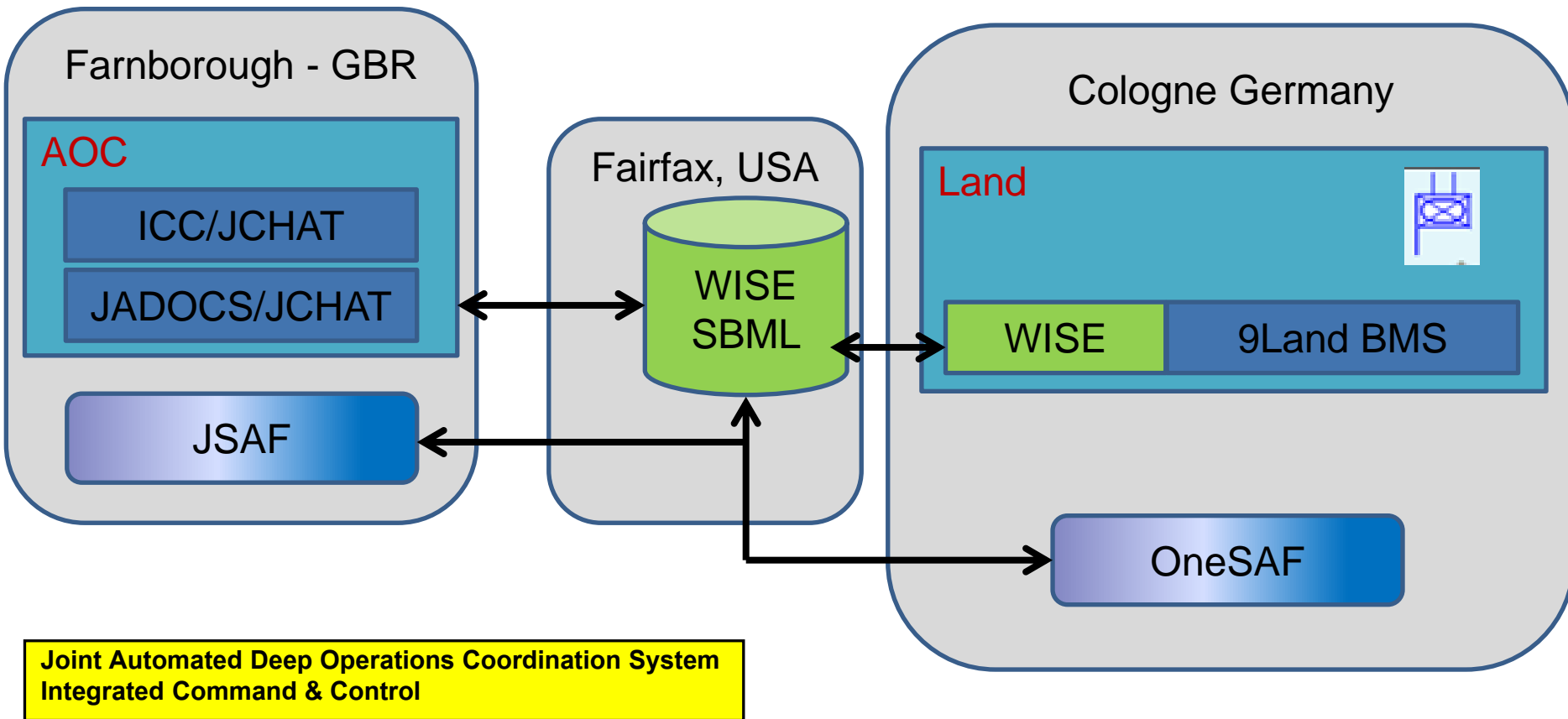




# MSG-085 - ITEC 2014 DEMONSTRATION



## *Distributed Joint Mission Planning*





# NATO MSG-085 Key Insights



- **Identified Needs and Findings:**

- Leveraging SISO MSDL & C-BML standards reduces development and integration costs;
- Common supporting web-enabled infrastructure eases cross coalition-based integrations;
- Defining specific coalition agreements reduces development, integration, and rework costs;
- Web-enabled distributed access to simulation and MC assets is critical





# OneSAF Support and Conclusions



# OneSAF Evolving Support for Mission Planning and Execution



Needs	OneSAF Support	Assessed Maturity
Fully automated behaviors	Semi-Automated	Minimal
Faster than real-time	Yes	Full
Transparent setup, execution, and control	Standards-based protocol (DIS) support	Partial service and web-based prototype
MC data for startup	Standards-based support	Partial prototype using PASS/DDS, C2R
Branch points	Yes	Partial prototype
Optimization criteria	Gap	Minimal
Running estimates	Combat power reporting	Minimal
Plan versus actuals	Gap	Minimal
Support for separation of simulation and real-world data	Protocols and tool gap	Minimal
Standards-based	HLA, DIS, MSDL, C-BML, USMTF, VMF, 2525B, ...	Partial prototype
Simulation and MC software reuse and extension	Integration and program focus support	Partial prototype
Coalition initialization and runtime agreement support	Standards-based (HLA, DIS, C-BML, MSDL) support	Partial prototype





# Conclusions



- **Mission Planning and Mission Execution Capabilities**

- Simulation-based capabilities requirements are expanding and maturing within the Mission Command community
- Simulation and Mission Command standards are maturing in support of an integrated approach
- Standards-focused engineering reduces development and integration time and cost

- **OneSAF Support**

- Successful prototype-based examples of employment within Mission Planning and Execution capabilities
- Provides a solid base for prototyping, maturing, and operationalizing the “required” simulation capabilities

- **Next Steps**

- Identify opportunities to shadow and support real-world MC experiments and events employing C2 Mission Planning and Execution activities
- Continue to operationalize simulation standards and their employment within NATO activities
- Continue to enhance and expand common simulation and C2 standards



Thank You

Questions and Comments