



Application of Mission and Means Framework to Distributed Testing – A Live Demonstration in Aug 2005



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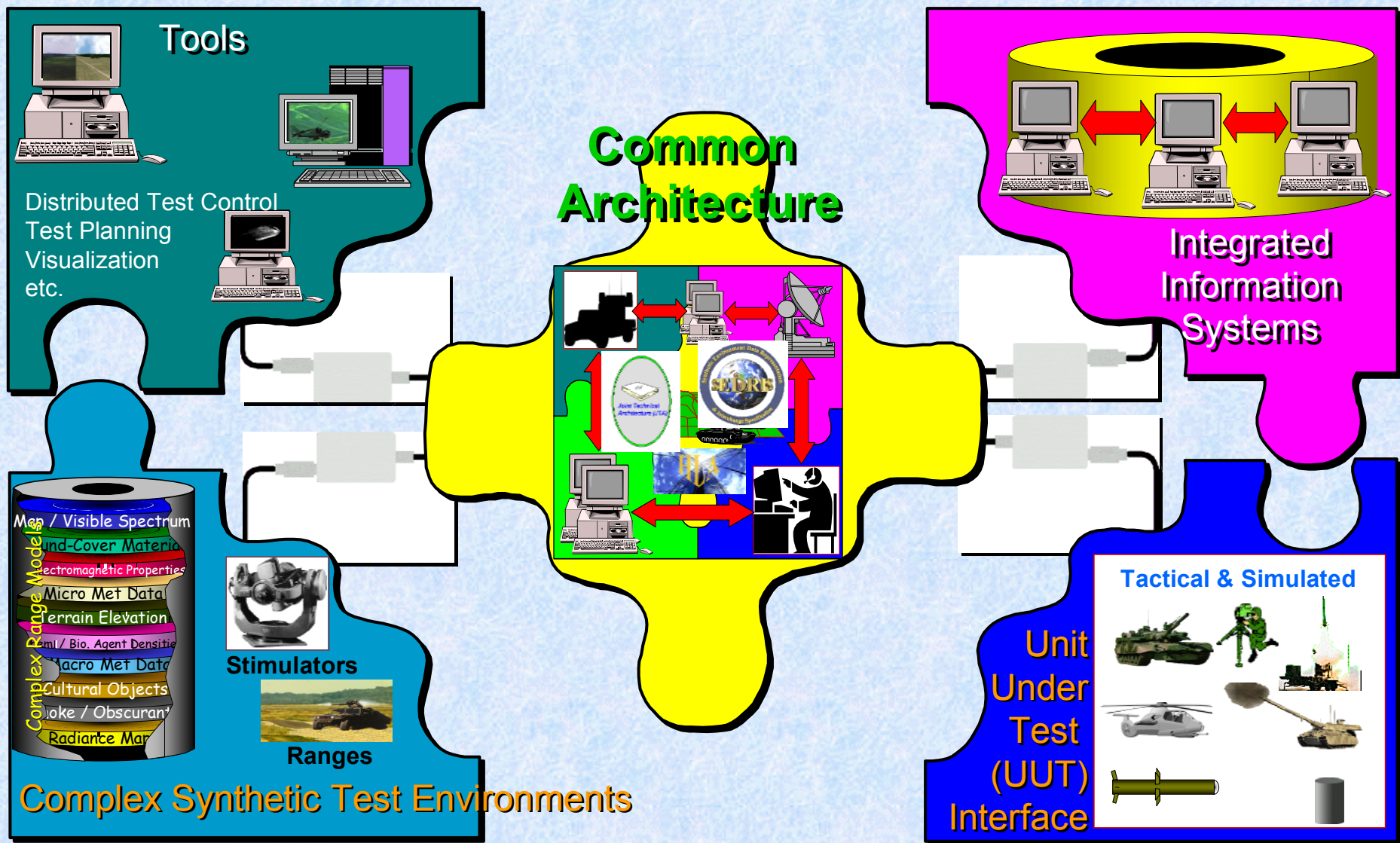


Agenda

- **Review: Distributed Test Event 4**
- **Distributed Test Event 5 Plans**
 - **Risk Mitigation Role for FCS Exp 1.1**
 - **M&S Collaboration Role for Army Cross-Command Collaboration Effort (3CE)**
 - **Baseline Demonstration Role for DoD Joint Mission Environment Test Capability**
- **Summary**



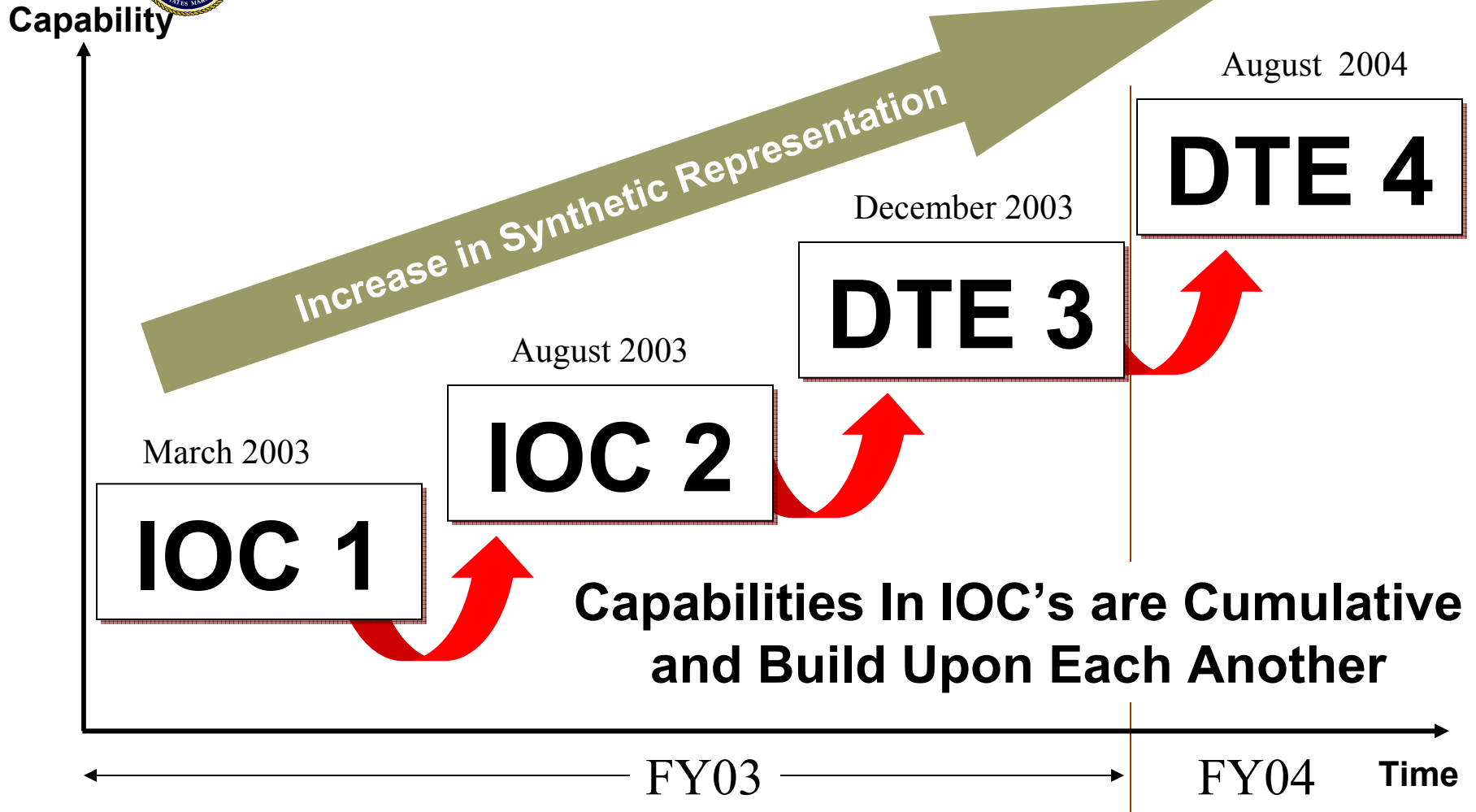
Top Level View of VPG



Placed in Motion With Common Computing and Communications Backbone



Distributed Testing Progression





Overview

DISTRIBUTED TEST EVENT 4 (DTE 4)

August 31 – September 2, 2004



Developmental Test Command

Live / Virtual / Constructive Platforms and Environments

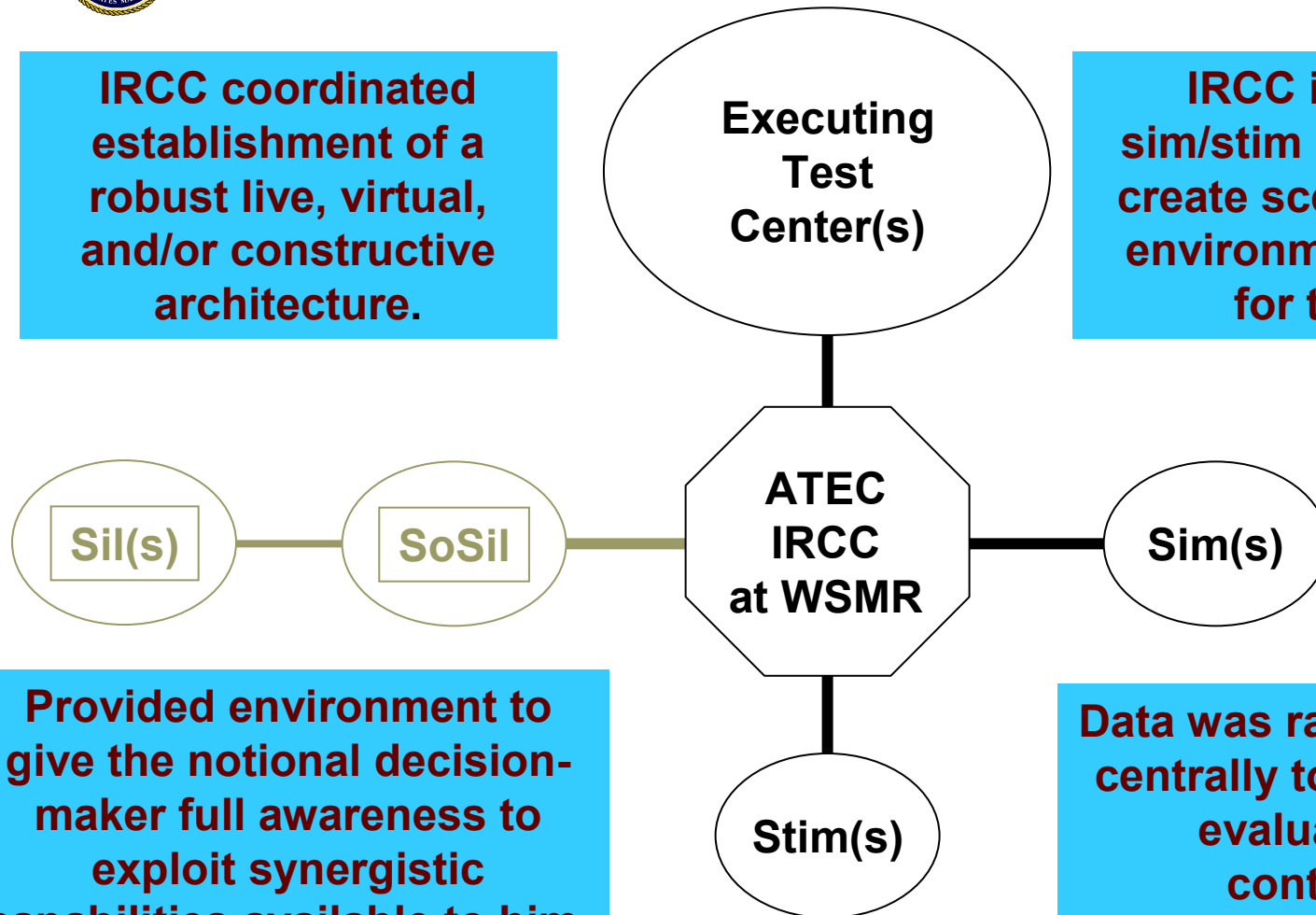
SITE	TEST MISSION	LIVE	VIRTUAL	CONSTRUCTIVE
ATC	Ground Mobility	Stryker	Vehicle Dynamics Mobility Server	Robotic Intelligence Lethality/Vulnerability
ATTC	Rotary Wing Platform RSTA Sensors		Flight Dynamics IR Sensor	
DPG	Chemical and Biological Defense	Stryker	Chem/Bio Sensor Weather Effects	
EPG	C4ISR	Shadow 200	RF Networks C2 Nodes	Battle Command
NVESD	RSTA Sensor R&D		Platform Sensors	
RTTC	Small Missiles RSTA Sensor	Helicopter (UAV) IR Sensors	Platform Sensors Aerial Sensors	OTB
WSMR	Large Missiles	5 T-72s Helicopter (UAV)		TOC, JANUS
YPG	Ground Mobility Environmental	Stryker NLOS-C Emulator		



Distributed T&E Architecture For DTE 4

IRCC coordinated establishment of a robust live, virtual, and/or constructive architecture.

IRCC integrated sim/stim processes to create scenario and/or environment required for the test.



Provided environment to give the notional decision-maker full awareness to exploit synergistic capabilities available to him.

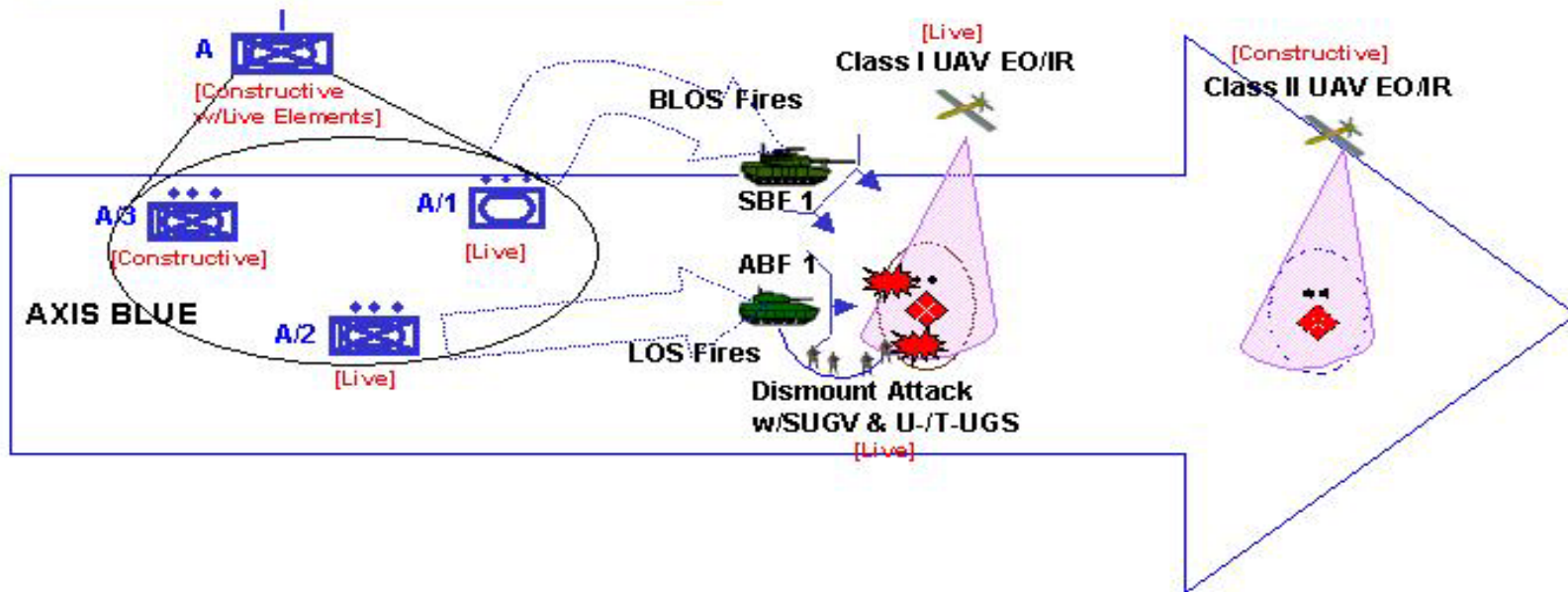
Data was rapidly available centrally to test director, evaluators and contractors.

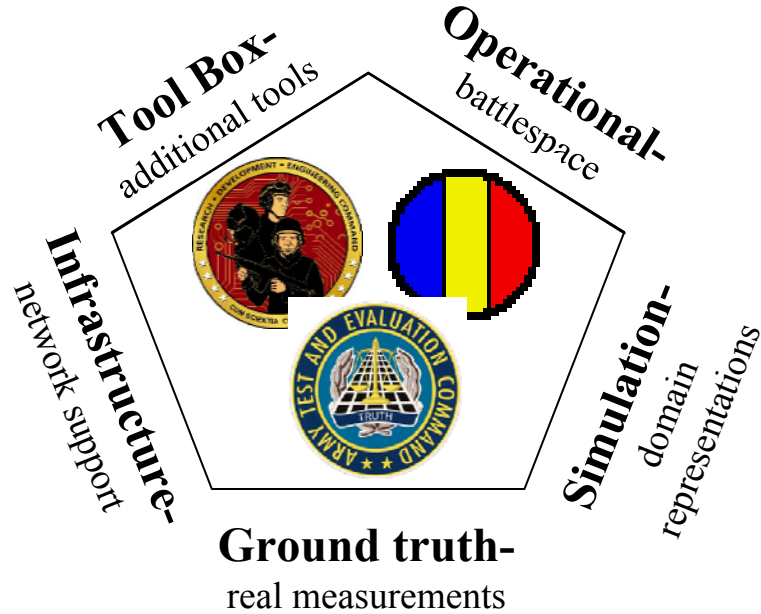


Plan for DTE-5: Conduct Risk Mitigation/Rehearsal for FCS Experiment 1.1: A Company Mounted Operation Supported by Platoon Dismounted Forces... ...in an Urban Environment

Step 1: Alpha Team (2 ICV & 1 MCS PLTs) moves along AXIS BLUE. Enemy dismount force is detected by A TM's Class II UAV in town. ICV PLT identifies enemy flank, and formulates & disseminates plan to all Soldiers. MCS PLT moves to SBF position. ICV PLT moves to secure locations & deploys Class I UAV, SUGV, and T-UGS. ICV PLT dismounts and attacks with direct fire & movement; deploys U-UGS. ICVs & weapons squads provide supporting LOS fires. MCS PLT provides supporting BLOS fires.

Step 2: Enemy force in town is defeated or captured. ICV PLT secures objective, and consolidates & reorganizes. Dismount PLT LDR transmits situation report & requests MEDEVAC support. MCS PLT covers dismount movement to ICV remount locations. ICV PLT quickly remounts ICVs. ICV PLT LDR updates SA for all Soldiers. MCS Class II UAV detects and identifies another dismounted force. Alpha Team continues attack along AXIS BLUE.





Enter the

Army Cross-Command Collaboration Effort (3CE)

MEMORANDUM OF AGREEMENT (MOA)
 AMONG
 THE US ARMY TRAINING AND DOCTRINE COMMAND (TRADOC) FUTURES CENTER (FC), THE US ARMY TEST AND EVALUATION COMMAND (ATEC), THE US ARMY RESEARCH, DEVELOPMENT, AND ENGINEERING COMMAND (RDECOM) AND THE PROGRAM MANAGER, UNIT OF ACTION (PM UA)

1. Reference: RDECOM s

2. Purpose: RDECOM M agreement if Collaborative purpose of d used in Syst Combat Sys within a real

3. Need: T M&S Execu among TRA more promt integral cap The 3CE wil by RDECOM concepts, pr individual sy UA and with supporting ti continue to f

4. Responsi

a. TRAD evaluation o equipped UA following to behavior dat trained subj developers. Environmen daily operati

b. RDECOM will be responsible for, but not limited to, science and technology development, spiraling technology, engineering physics based models/prototypes, systems engineering, performance data and environmental data. RDECOM will partner with TRADOC, ATEC, and PM UA in the development and use of the Modeling Architecture for Technology, Research and Experimentation (MATREX) Science and Technology Objective (STO). RDECOM will assist with the daily operations and configuration control of 3CE.

c. ATEC methodologic stimulation to loop testing. evaluation (T the use and de assist with the

d. PM UA prototypes de 3CE in the de will assist wit

5. Managem measure until CONOPS for including asse structure, each

a. Genera Simulation an Executive Par for 3CE.

b. Manage direction reco configuration

c. Technic environment of

6. Resources for technical i FY05) and wi maintain and Executive Par above three pe capabilities of

7. This MOA is effective upon signature and will be implemented immediately.

 ALLAN M. RESNICK Director, Requirements Integration TRADOC Futures Center (date) 8 Nov 04	 BRIAN BARR Technical Director US Army Test and Evaluation Command (date) 12-7-04
 ROGER A. NADEAU Brigadier General Deputy Commanding General, Research, Development and Engineering Command, SOSI (date) 4 Dec 04	 CHARLES A. CARTWRIGHT Brigadier General Program Manager Unit of Action (date) 12/21/04

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Why 3CE?

PM UA requires a disciplined, M&S collaboration effort in partnership with TRADOC, RDECOM, and ATEC to reduce costs and time for FCS-Equipped UA development.

- **Formalize collaboration efforts among TRADOC, ATEC, RDECOM, PM UA and LSI**
- **Create a shared M&S and data environment**
- **Support and leverage each Commands M&S environments supporting the development of FCS-Equipped UA**
- **Ensure the ability to accept LSI virtual prototypes**



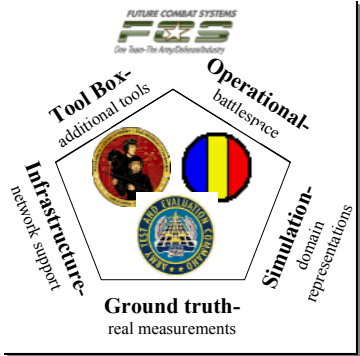
Objectives

□ Short Term –

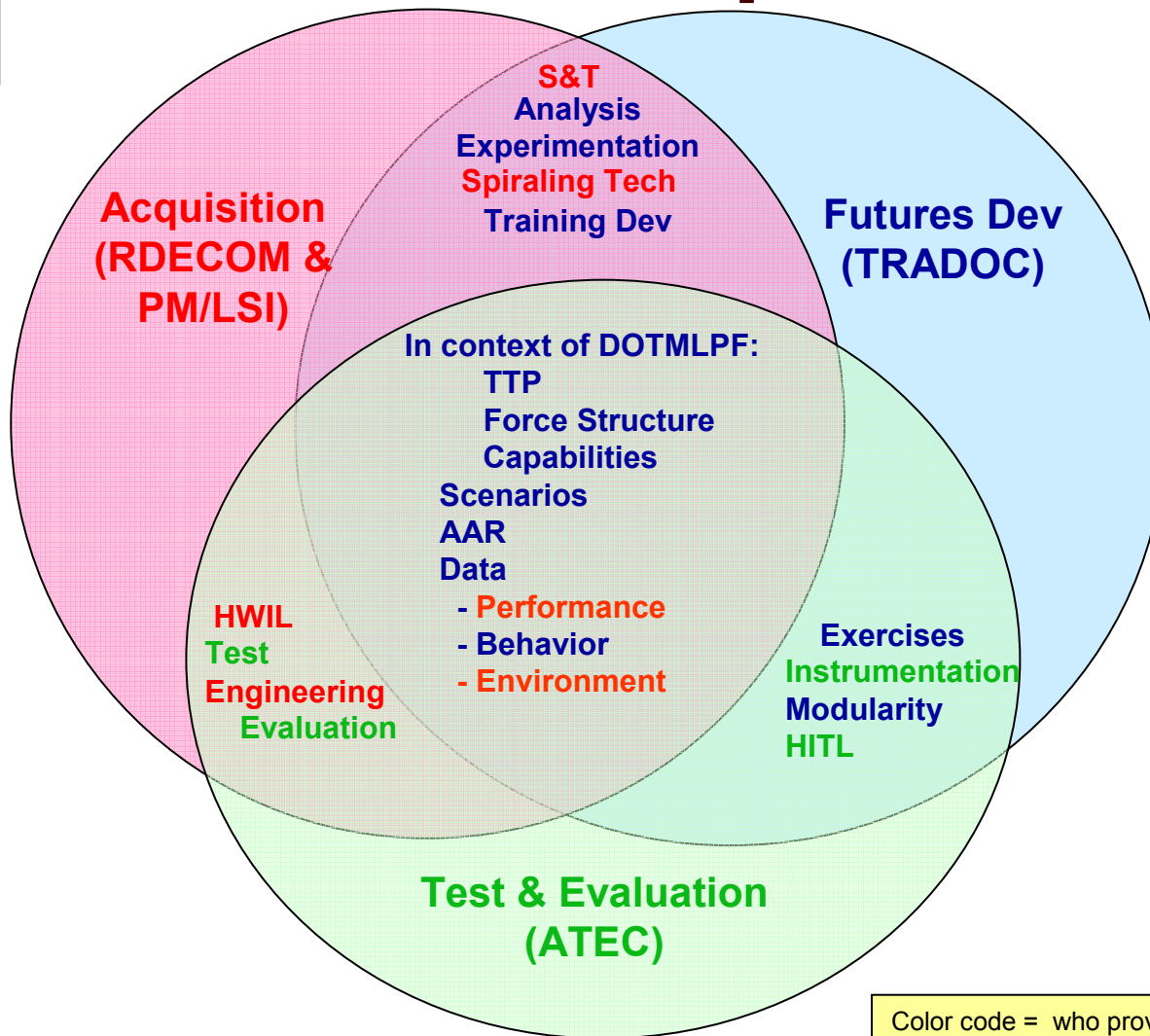
- Compare each command's existing M&S environments
- Develop a common set of M&S tools, data, and business processes
- Develop authoritative representation of the FCS-Equipped UA within a UE context

□ Far Term –

- Apply systems engineering approaches for integration and interoperability
- Evolve environment to achieve consistent and credible results suitable for analysis and evaluation
- Develop authoritative representation of a JIM environment

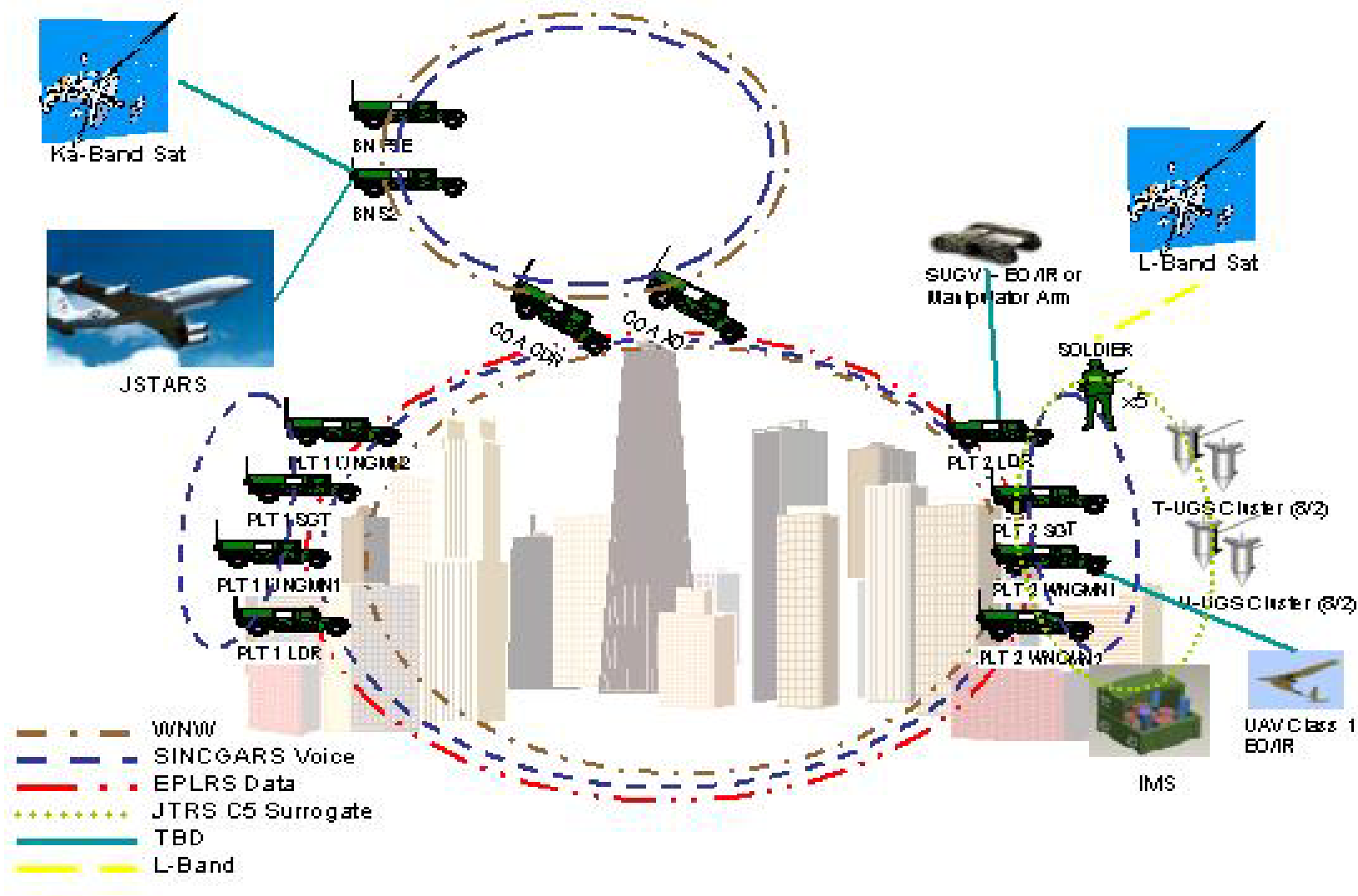


3CE Organization Roles and Responsibilities

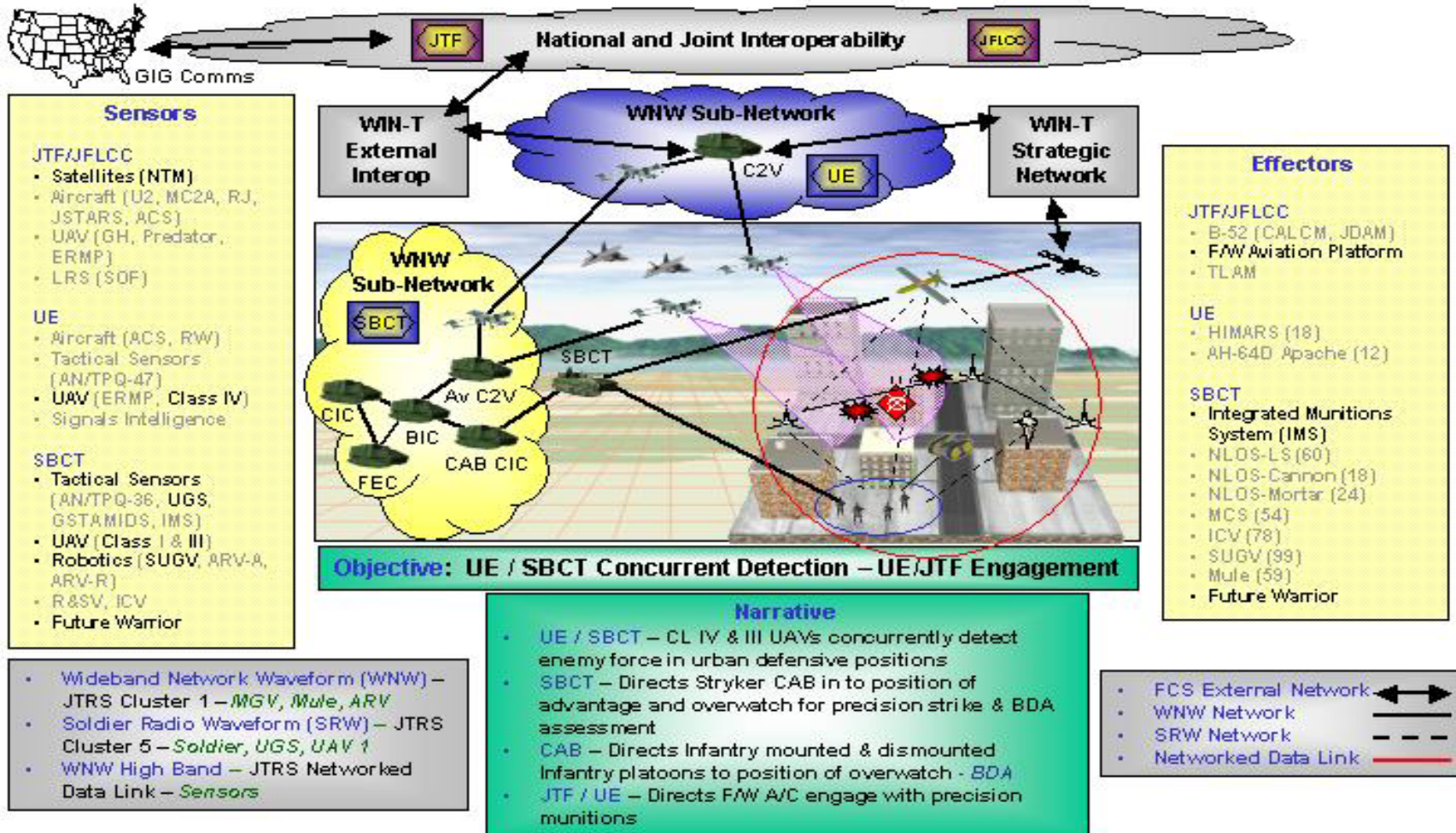


Color code = who provides
Placement = roles, mission, functions

Experiment 1.1 Operational View



Experiment 1.1 Mission Execution Thread





SPG Requirement for Joint Testing in Force Transformation



- Department Policy to be Implemented:
 - Developing and fielding joint force capabilities that provide adequate, realistic test and evaluation in a joint operational context
 - Department will provide new testing capabilities and institutionalize the evaluation of joint system effectiveness as part of new capabilities-based processes

- The Task:
 - DOT&E to *“develop a roadmap for the Deputy Secretary of Defense... that identifies the changes needed to ensure that test and evaluation is conducted in a joint environment and facilitates the fielding of needed joint capabilities.” **

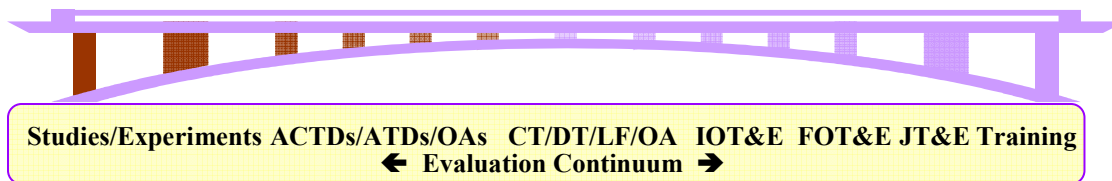
 - Coordinate with: AT&L; Services, CJCS, JFCOM, P&R



The Roadmap

Fundamental Tool for Transformation

Concept → Contract → Combat
Testing in a Joint Environment Roadmap



T&E Current State

Established Service-unique T&E Capabilities
World-Class Facilities
Modernization Needed

Conduct of T&E
•Service-Centric
•System-Centric

Acquisition Decisions
Service Mission
System Spec. Performance

Existing Distributed T&E Networks
•Diverse
•Service-Centric
New Network Initiatives

Components of the Roadmap

T&E Policy
Testing in a Joint Environment
Department Requirement
DoD 5000 series, CJCSI 3170 series, etc.
FY05 →

T&E Methods/Processes
Live Forces Mandatory
Partnership with Training
Trained and Equipped Guard/Reserve
Controlled use of simulations augment OT&E
Joint Scenario Mission Decomposition
FY05 ↔ FY11 →

T&E Infrastructure
Significant Common Infrastructure Solution
Supports OT&E and DT&E
Overarching Backbone of Connectivity
Critical Prerequisite for Net-Centric Dev. and Testing
Will meet a broad spectrum of other needs
FY05 ↔ FY11 →

T&E Objective State

Common Support for Experimentation, Development, Testing & Training, all in a Joint Environment

Conduct of T&E
Adequate Realistic
In a Joint Environment

Informed Decisions
Joint warfighting systems or systems-of-systems
Suitable & Effective for Joint Missions

Overarching Integration
Linking Separate Service/Agency Capabilities
Links Live, Virtual & Constructive
Common, Fully Enhanced Network Infrastructure w/Standards & Protocols

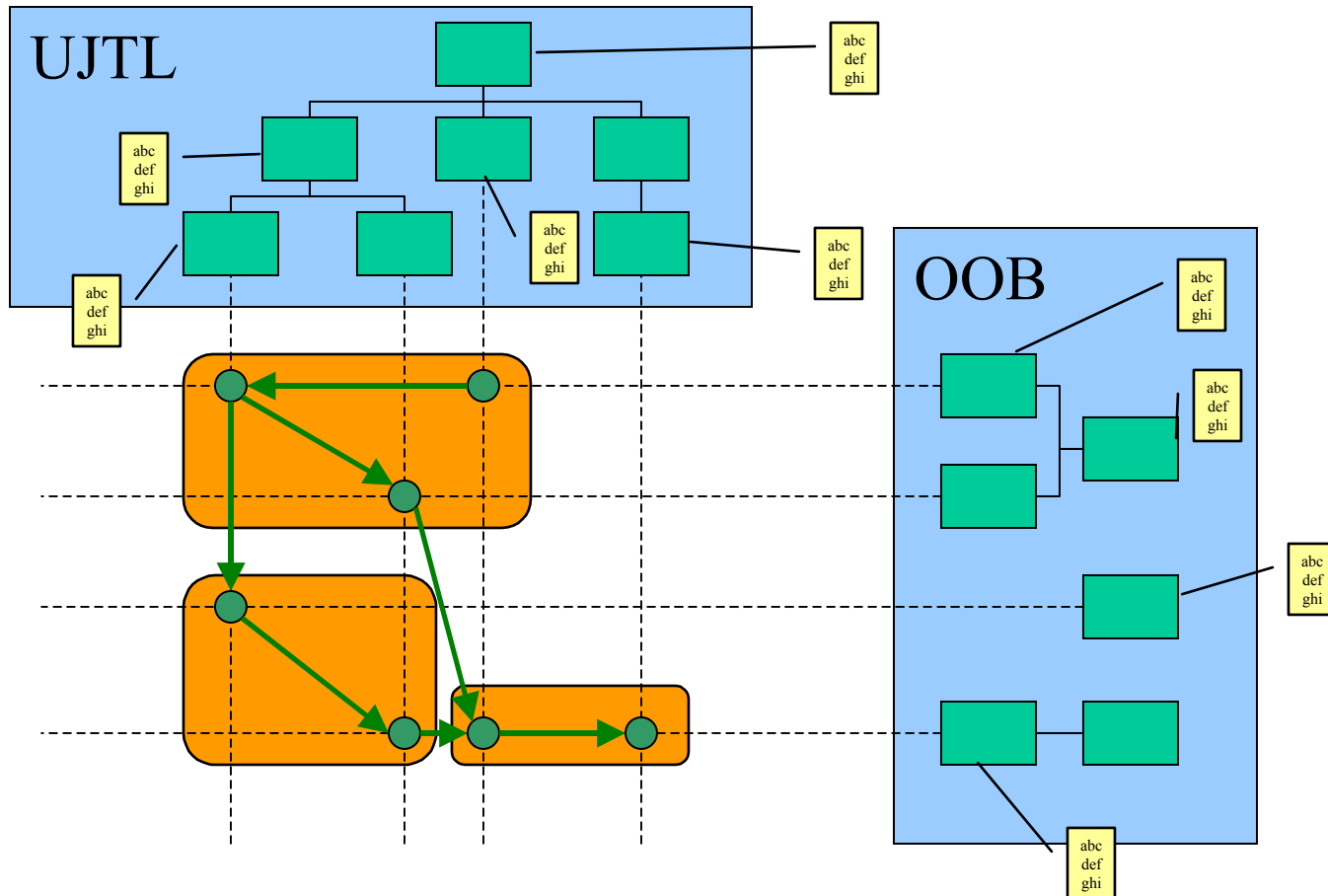


Multi-Service Distributed Event (MSDE)

- **Purpose** – *Provide a baseline understanding and description of current ability to create a Joint Mission Environment for Testing.*
- **Framework** - Accomplish joint tasks by adding assets that include test items from each service to DTE 5
- **Overall Issue** – What is the current ability of distributed L-V-C assets to determine how well a number of test items supported accomplishment of a joint task while also determining how well each item performed at the system level?
- **Support for JT&E** – Identify focus areas along with objective information on cost-benefit of each area



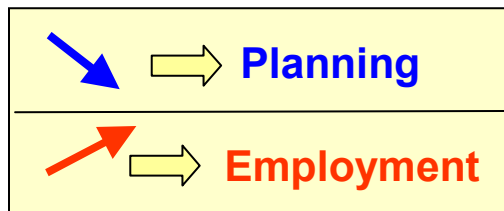
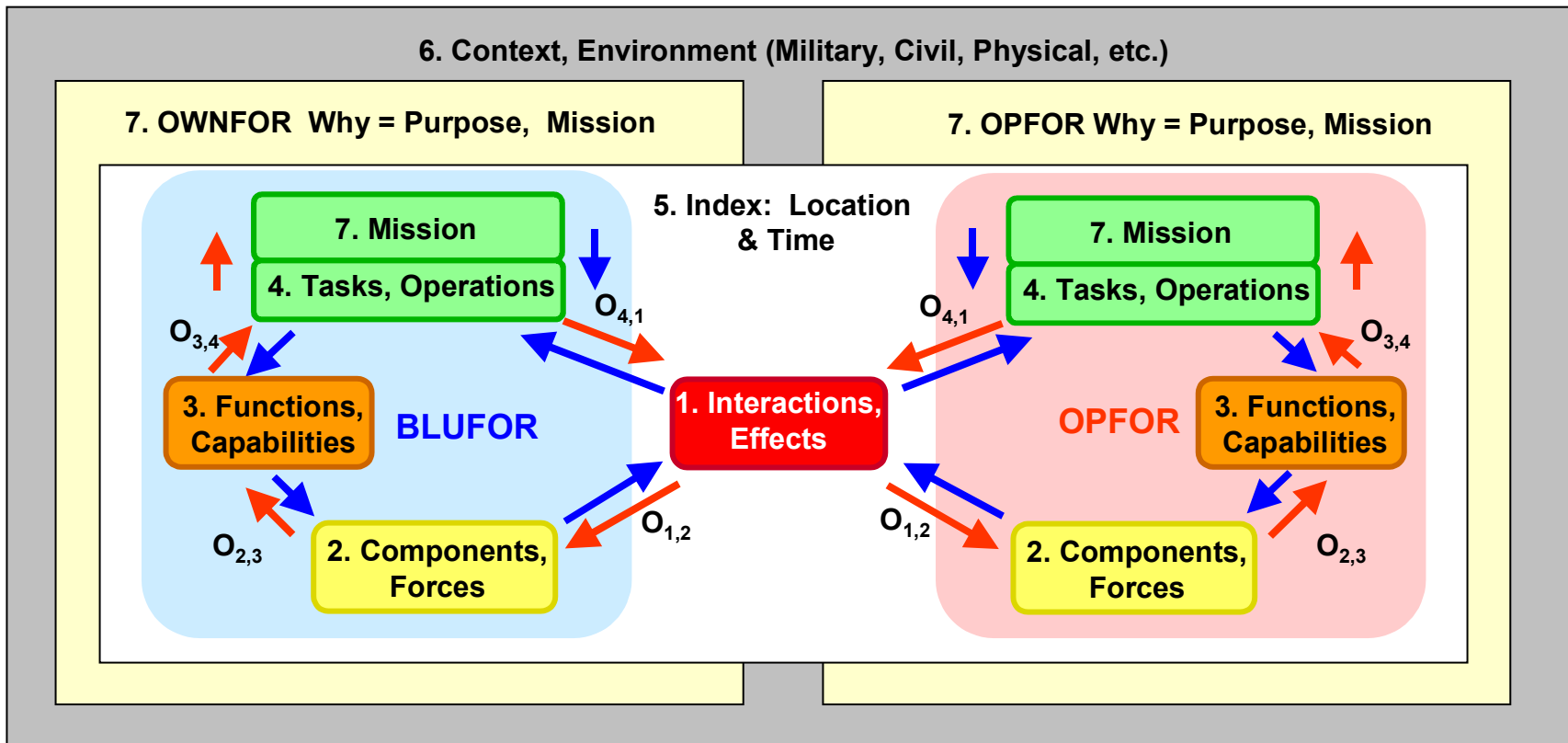
MSDE Analysis Framework



Missions and Means Framework

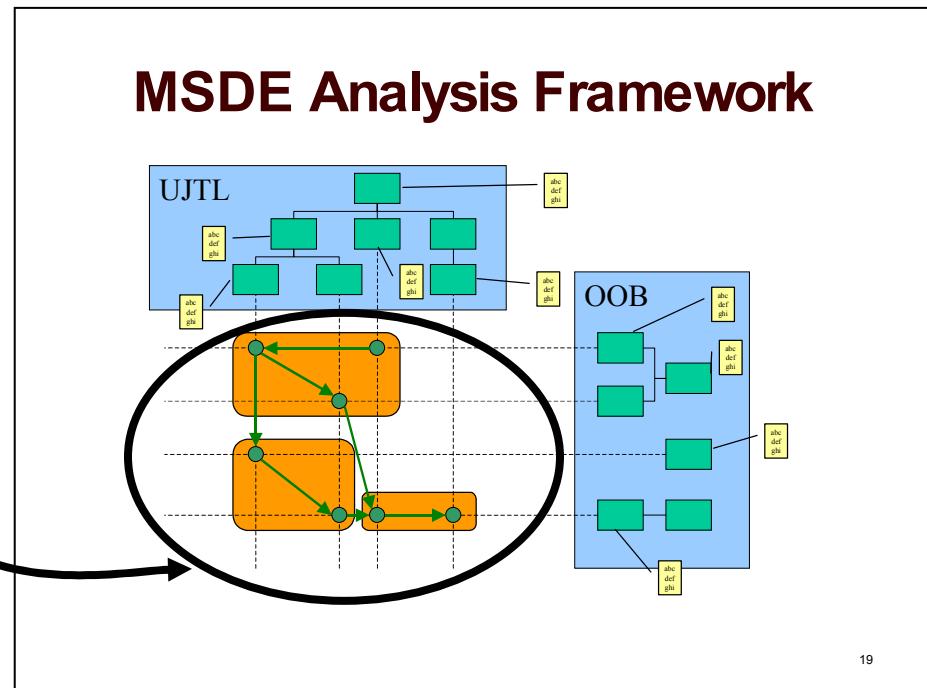
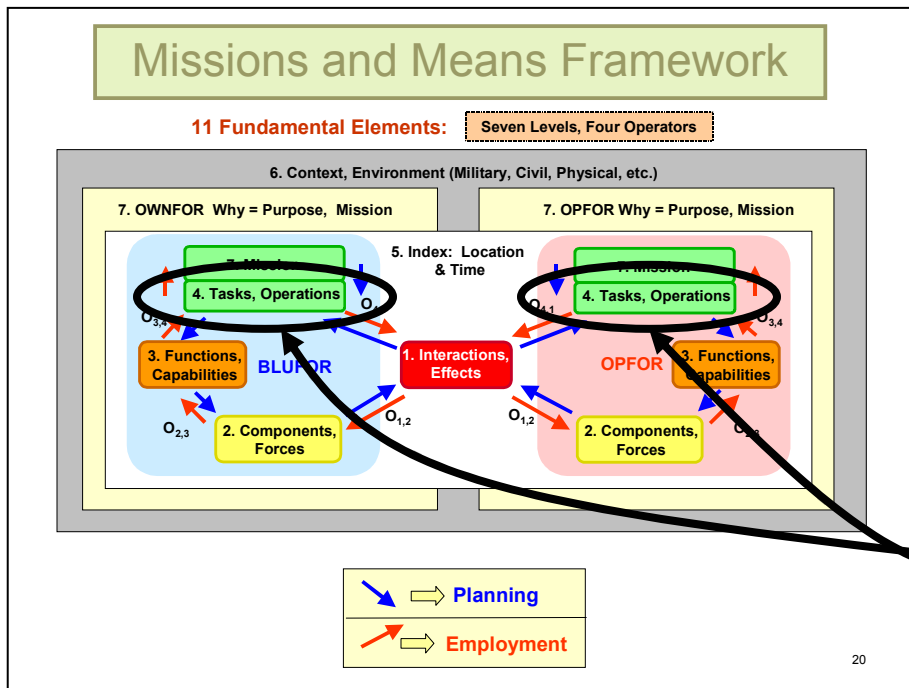
11 Fundamental Elements:

Seven Levels, Four Operators





Linking MSDE Analysis to the MMF



- Use Joint Tactical Tasks to define the operation
- Decompose the tasks to understand component-level influences
- Instrument the components to measure their activities
- Synthesize the tasks as a manifestation of component interactions



MSDE Joint Tactical Task Layout

SWC (BFT/NTM)
Schriever AFB, CO



Rivet Joint

Offutt AFB, NE



AWACS-DMOC



JSTARS-DMOC



Fighters – DMOC/SIMAF/China Lake



E-2C – Pax River



UAV – Air Force
(SIMAF)



FAC-A – DMOC/SIMAF/China Lake



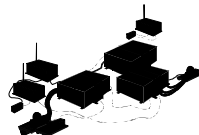
CAOC-X
Langley AFB, VA
DLARS
T-Bone
TBMCS



UAV – Army
(WSMR/EPG)



UA
AVC2V WSMR, Ft Lewis, TBD
FSCC* WSMR, Ft Lewis, TBD



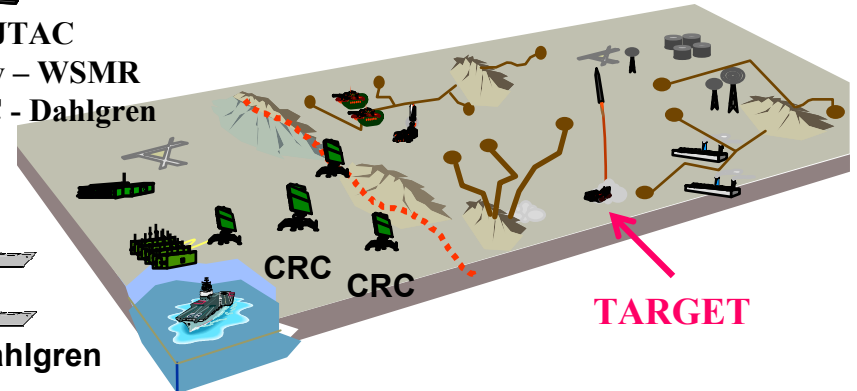
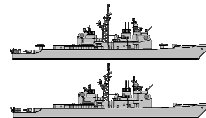
JTAC
Army – WSMR
USMC - Dahlgren



ASOC/DASC
Fort Hood, TX

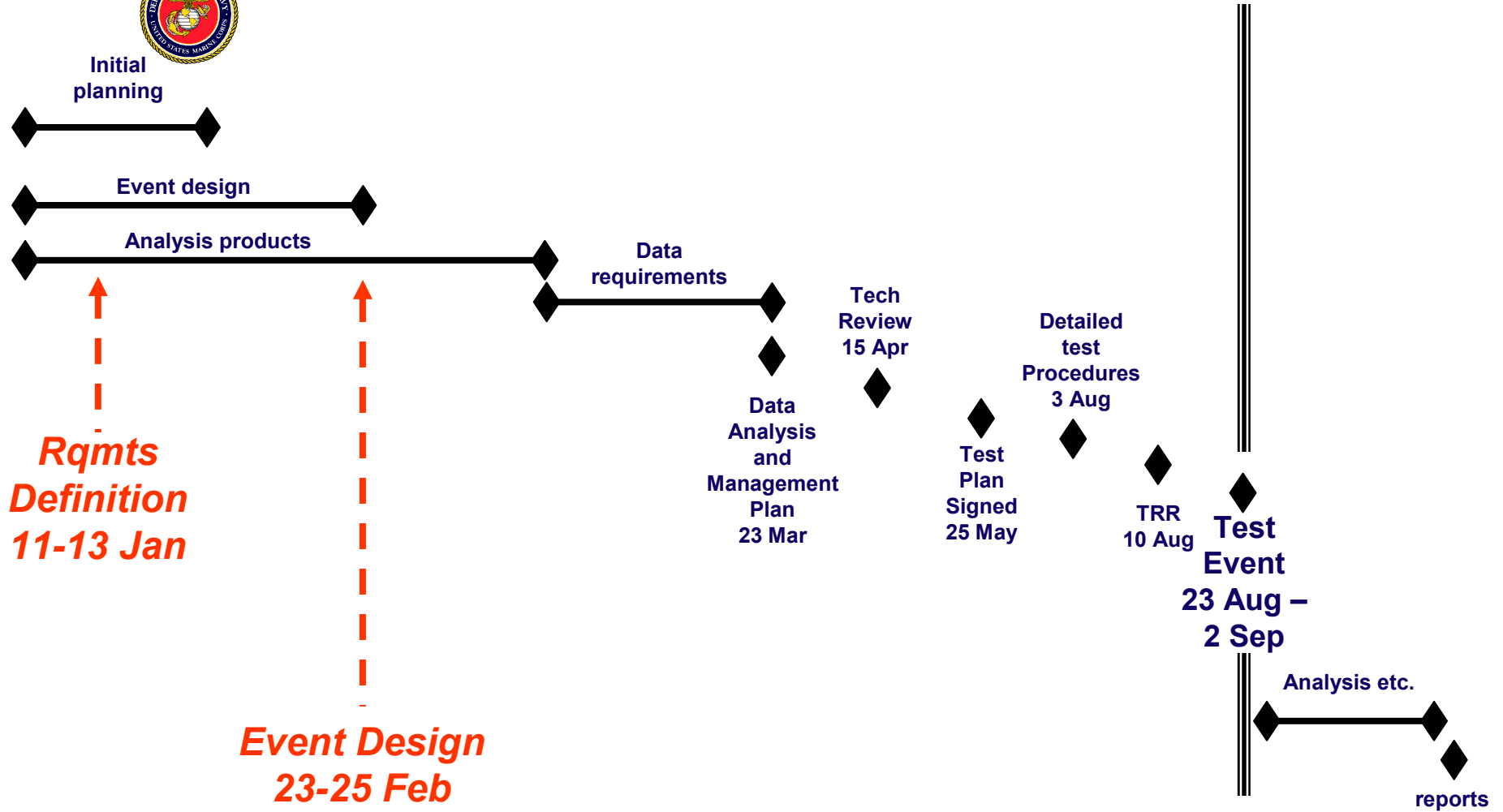


AEGIS- DDG Dahlgren





MSDE Key Milestones





Summary

- **Distributed Test Capability facilitates spiral forward into Current Force as well as development of Future Force.**
- **DTE 5 will serve as focusing event for understanding Testing in a Joint Environment.**
- **Mission & Means Framework will be used as an analysis method for this event.**