Net Centric Operations Conference

“Achieving the Goals for the Net Centric Information Environment”

Norfolk, Virginia

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Overview

- DOT&E Oversight of Net Centric Programs
  - GIG Net Centric Information Environment – DOT&E Oversight Programs

- Net Centric T&E Challenges

- DOT&E Net Centric Policy and Guidance
  - Six-Step OT&E Process to Assess IA
  - Determining Level of Test for Software Intensive Systems

- DOT&E Net Centric Pilot Initiatives
  - Net Centric Enterprise Services (NCES) Program
  - Net-Enabled Command and Control (NECC)

- DOT&E Involvement in Other Net Centric Initiatives
  - IO Range Site Status

- Summary
DOT&E Oversight of Net Centric Systems

• Significant Net Centric Systems under DOT&E oversight:
  – DoD/Joint: Net Centric Enterprise Services, Net-Enabled Command and Control, Distributed Common Ground System family, Defense Travel System, Business Systems Modernization
  – Army: FCS, Joint Tactical Radio System-Ground
  – Air Force: Air Operations Center, Battle Control System
  – Navy: Cooperative Engagement Capability

• Net Centric initiatives placed under DOT&E oversight by Congress:
  – Assess Information Assurance and Interoperability at the Combatant Commands
  – Oversee testing to support DoD’s transition to IPv6

• Significant commonalities:
  – Intensive software development and/or “commercial-off-the-shelf” hardware
  – Incremental development with spiral releases
  – Shorter development, fielding timelines than “standard” weapons development

Soon, many oversight systems will be considered “net-centric” because they share data across a network or through a web page to support execution of a mission.
GIG Net Centric Info. Environment – DOT&E OS Programs

**NARROWBAND**
- Mobile User Objective System
- Commercial

**WIDEBAND**
- Advanced Extremely High Frequency Satellite
- Joint Tactical Radio System mobile/cellular technology
- Family of Advanced Beyond-Line-of-Sight (BLOS) Terminals
- Navy Multi-band Terminal

**FUTURE SINGLE SPACE BACKBONE**
- Advanced Polar
- Teleport
- Transformational Satellite

**SPACE-BASED COMMUNICATIONS**

**PLATFORMS**

**GROUND or AIRBORNE TERMINALS**

**Deployed Networks and Communications**
- Joint Network Node, Warfighter Information Network - Tactical,
  - High Capacity Communications Capability,
  - Joint Tactical Radio System

**Backbone & User Networks - Defense Information Systems Network**
- Teleport
  - Global Electromagnetic Spectrum
  - Information System
  - Multi-National Information Sharing
  - Combat Information Transport System

“It’s all about the network!”
Net Centric T&E Challenges

- Capabilities documents do not provide a meaningful link between technical performance measures and operational mission performance

- Operational Test Adequacy - Defining the relevant operational environment

- Joint environment not clearly defined

- Determining suitability

- No clear evaluation methodology for capabilities in the net centric environment

- Linking the testing of Information Assurance with the testing of Net Centric capabilities is still a work in progress
### Net Centric T&E Challenge - Technology Development vs. DOTMLPF

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<th>Accelerated Development and Fielding for</th>
<th>FUTURE</th>
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<tr>
<td>Doctrine</td>
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Any point in time, War Fighter able to Fight and win Nation’s War

**We are all experimenting on how best to do T&E of Net Centric Systems. Cooperation will get us there!**
DOT&E Net Centric Policy and Guidance

• Policy for Operational Test and Evaluation of Information Assurance in Acquisition Programs – signed 21 November 2006
  – The Test and Evaluation Master Plan must contain an operational test and evaluation strategy for IA assessment.
  – This policy addresses IA end-to-end, taking into account the ability to detect, defend, react, respond, and restore.

• Guidelines for Conducting Operational Test and Evaluation (OT&E) for Software-Intensive System Increments – signed 16 June 2003
  – Guidelines for tailoring pre-deployment test events to the operational risk of a specific system increment acquired under OSD oversight
    • For insignificant to moderate risk increments, these guidelines streamline the OT&E process by potentially reducing the degree of testing.
    • Applies to all increments of software-intensive systems except the “core increment,” which undergoes full operational testing.
Six-Step OT&E Process to Assess IA

STEP 1
DETERMINE IF THE PROGRAM IS COVERED BY DOT&E IA POLICY. IF COVERED, FOLLOW STEPS 2 THROUGH 6

STEP 2
INITIAL OTA REVIEW & RESOLUTION OF IA REQUIREMENTS (MAC, CL, IA-CONTROLS)

STEP 3
OTA REVIEW OF DT&E DATA & RESOLUTION OF RESIDUAL RISKS UNCOVERED DURING DT&Es

STEP 4
INITIAL IA ASSESSMENT & RESOLUTION OF RESIDUAL RISKS

STEP 5
IA RED TEAM ASSESSMENT OF ALL MAC I, MAC II (CLASSIFIED/SENSITIVE), AND SYSTEMS OF CONCERN TO OTA

STEP 6
ALTERNATE SITE CONTINUITY OF OPERATIONS ASSESSMENT OF MAC I SYSTEMS

MAC = Mission Assurance Category
CL = Confidentiality Level
Determining Level of Test for Software Intensive Systems

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<th>Failure Potential</th>
<th>Effect on Mission</th>
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<tr>
<td></td>
<td>Minor Impact</td>
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<tr>
<td>Insignificant</td>
<td>Level 1 test</td>
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<tr>
<td>Low</td>
<td>Level 1 – 2 test</td>
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<tr>
<td>Moderate</td>
<td>Level 2 - 3 test</td>
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<tr>
<td>High</td>
<td>Level 3 – 4 test</td>
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- Level 1 test is DT
- Level 2 test is combined DT/OT
- Level 3 test is Operational Assessment
- Level 4 test is IOT&E level
DOT&E Net Centric Pilot Initiatives

• Net Centric Enterprise Services (NCES) Program
  – Pilots use of the risk assessment process in the “Guidelines” prior to fielding of the core increment
  – Testing supports limited fielding of individual NCES services prior to IOT&E

• Net-Enabled Command and Control (NECC)
  – New Lead-OTA management construct
  – Working with user and capabilities development communities to develop meaningful and measurable measures of effectiveness and performance.
• **Information Operations (IO) Range**
  - A flexible, seamless, and persistent environment to assess and train
    - 15 geographically separated sites are fielded
  - End state is a fully integrated network of ranges used by Services, Combatant Commands, and Agencies, to test, train, exercise and demonstrate tactics, techniques, and procedures of emerging IO capabilities.

• **Information Operations Network Analysis Model**
  - To optimize the planning and execution of operational tests, and extrapolate beyond available test conditions to support operational evaluations.
  - The IO Range and other communities will use it for training, experimentation, and planning for IO systems to be tested on the IO Range.
  - Provides three major capabilities:
    - **Network Visualization.** A visual depiction of the network that also provides a means for evaluators to do operational network analysis.
    - **Network Scenario Development.** Develops scenarios of different topologies that accurately represent diverse communications plans and architectures to rapidly change network attributes and perform excursions and sensitivity analyses.
    - **Network Analyzer.** What areas of the network are most sensitive to operational stresses and attacks?
IO Range Site Status

- 15 Sites Fielded to Date
  - 9 Service Delivery Points (SDP)
  - 3 Sub-sites (located at Ft Meade)
  - 3 Transportable SDPs (TSDP)

Legend
- Persistent
- Transactional
  - Installed
  - In Progress

Current as of: 21 February 2007
• Joint Mission Environment Test Capability (JMETC)
  – Working with the USD(AT&L) Test Resources Management Center to execute the Testing in a Joint Environment Roadmap
  – Purpose is to create a common corporate networking capability to link live systems with virtual and constructive representations to generate a realistic joint mission test environment for the systems being tested

• Joint Test and Evaluation Methodology (JTEM) – DOT&E sponsored Joint Test and Evaluation study
  – Purpose is to develop methodology for conducting Joint distributed testing
  – To be discussed by JT&E panel that follows
Summary

- DOT&E is experimenting with methods to determine how best to test and evaluate net-centric systems

- But this is an evolving process….
  - Requires close coordination between the user, material provider, and the test and evaluation communities
  - Material providers must understand fielding a net-centric capability cuts across the entire DOTMLPF spectrum (doctrine, organization, training, material, leadership and education, personnel, facilities), its not just about material or software

**DOT&E is open to suggestions from industry on how to improve our T&E processes for net centric systems.**