Network Centric Operations Industry Consortium Panel

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Ms. Sheryl Sizelove
Mr. Michael Curtis

NDIA NCO Conference
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Agenda

- **Consortium Overview and Role in NCO**
  - ***Dr. Kevin J. Reardon***, Captain, USN (Ret.)
    Executive Director, NCOIC
- **Enabling Net-Centricity – NCOIC's Role**
  - ***Hans W. Polzer***, Lockheed Martin
    Vice Chair, NCOIC Services & Information Interoperability WG
- **Technical Role and Value of NCOIC**
  - ***Sheryl Sizelove***, Boeing
    Vice Chair, NCOIC Technical Council
- **NCOIC's Current Position and Vectors**
  - ***Michael Curtis***, IBM
    Chair, NCOIC Technical Council

Network Centric Operations
Industry Consortium

Consortium Overview and Role in NCO

March 14, 2006

Dr. Kevin J. Reardon
Captain, USN (Ret.)
Executive Director, NCOIC

Our Scope

DoD, DHS, NATO and MoD International Force Transformation

- NCO is the underlying foundation of “Force Transformation” in DoD and throughout the armed forces of our allies
- Force Transformation is a new strategic context
  - New Theory of War based on Information Age principles and phenomena
- New relationship between operations abroad & homeland security dealing with a considerably broadened threat context:
  - State/Non-State
  - Nodal/Non-nodal
  - Symmetric/Asymmetric
  - Traditional/Unrestricted

Our Mandate

Enable Transformation Through NCO

- Joint transformation requires an “intellectual infrastructure” that includes:
  - Enhanced training programs
  - Development of an International Network Centric Environment
  - Provision of assured Interoperability
  - Path breaking concept development and experimentation
  - Effective programs to capture and implement lessons learned
  - Common and open interoperability standards

Admiral Edmund Giambastiani, Jr. USN
Vice Chairman, Joint Chiefs of Staff

- “Knowledge is both a fundamental principle and instrumental resource in our efforts to secure our borders and people. The Department has made widespread coordination and information sharing the hallmark of our new approach to homeland security.”

Tom Ridge
former
Secretary, Department of Homeland Security

Also Our Mandate

Global Participation & Engagement

"I have two major goals:

1. Make NATO transformation needs as transparent as possible to industry
2. Stop wasting money on R&D that is ongoing in Europe and the US

The consortium can help me to achieve these goals. We need industry involvement. What you are doing is important and it has to be done. Let me know what I can do to help."

General Kujat, Former Chairman of the NATO Military Committee

"We can work together on the building blocks NATO needs to achieve network centric operations. There are several ways we can move forward to collaborate on technical activities."

Marshall Billingslea, Assistant Secretary General for Defense Investment

Consortium Vision and Mission

Responding to the Need

- Vision:

Industry working together with our customers to provide a network centric environment where all classes of information systems interoperate by integrating existing and emerging open standards into a common evolving global framework that employs a common set of principles and processes.

- The Mission of the Consortium is to help accelerate the achievement of increased levels of interoperability within, and among, all levels of government involved in Joint, Interagency and Multinational (JIM) operations.

Why the NCOIC?

Industry Leadership to Reduce NCO Time-To-Market

- Forum for Subject Matter Experts to Collaborate on NCO Initiatives
  - Better Understand Customer's NCO Vision, Goals, and Objectives
  - Exchange Strategies and Proven Approaches to Enhance System Delivery
- Committed to Establishing Open, Interoperable Systems using Common Best Practices and Systems Engineering Techniques
  - Facilitates Consistency Across Industry
  - Advocates for Open and Interoperable Systems Design
- Companies Collaborating to Accelerate Transformational Efforts
  - Understanding Industry's Responsibilities and Acting
  - Addressing the Problem, Taking Initiative, Understanding the Requirement

Consortium exists to exchange ideas and produce process and technology deliverables that facilitate force transformation through NCO

Introducing the Consortium

Member Companies

- Leading international aerospace, defense, IT systems and professional services firms who have extensive experience with:
  - DoD
  - Intelligence Agencies
  - DHS
  - NATO
  - MoDs
  - International Law Enforcement Community
  - State/Provincial and Local Governments.
- Companies of all sizes, “think tanks” and academic institutions
- Open:
  - Participation open to all,
  - Fair, equitable, and vendor-neutral processes,
  - Work based on relevant industry open standards and practices.

NCOIC Members

Total Members: 82

Tier 1 Members (23)

- BAE Systems, Inc.
- Boeing
- Cisco Systems
- Deloitte & Touche
- EADS
- EFW
- EMC
- General Dynamics
- Harris Corporation
- Hewlett-Packard
- IBM
- Intel Corp.
- ITT Industries
- L-3 Communications Integrated Systems
- Lockheed Martin
- Northrop Grumman
- Oracle
- Raytheon
- Rockwell Collins
- Saab
- SAIC
- Sun Microsystems
- Thales

Tier 2 Members (2)

- Alcatel Government Solutions
- Factiva

NCOIC Members

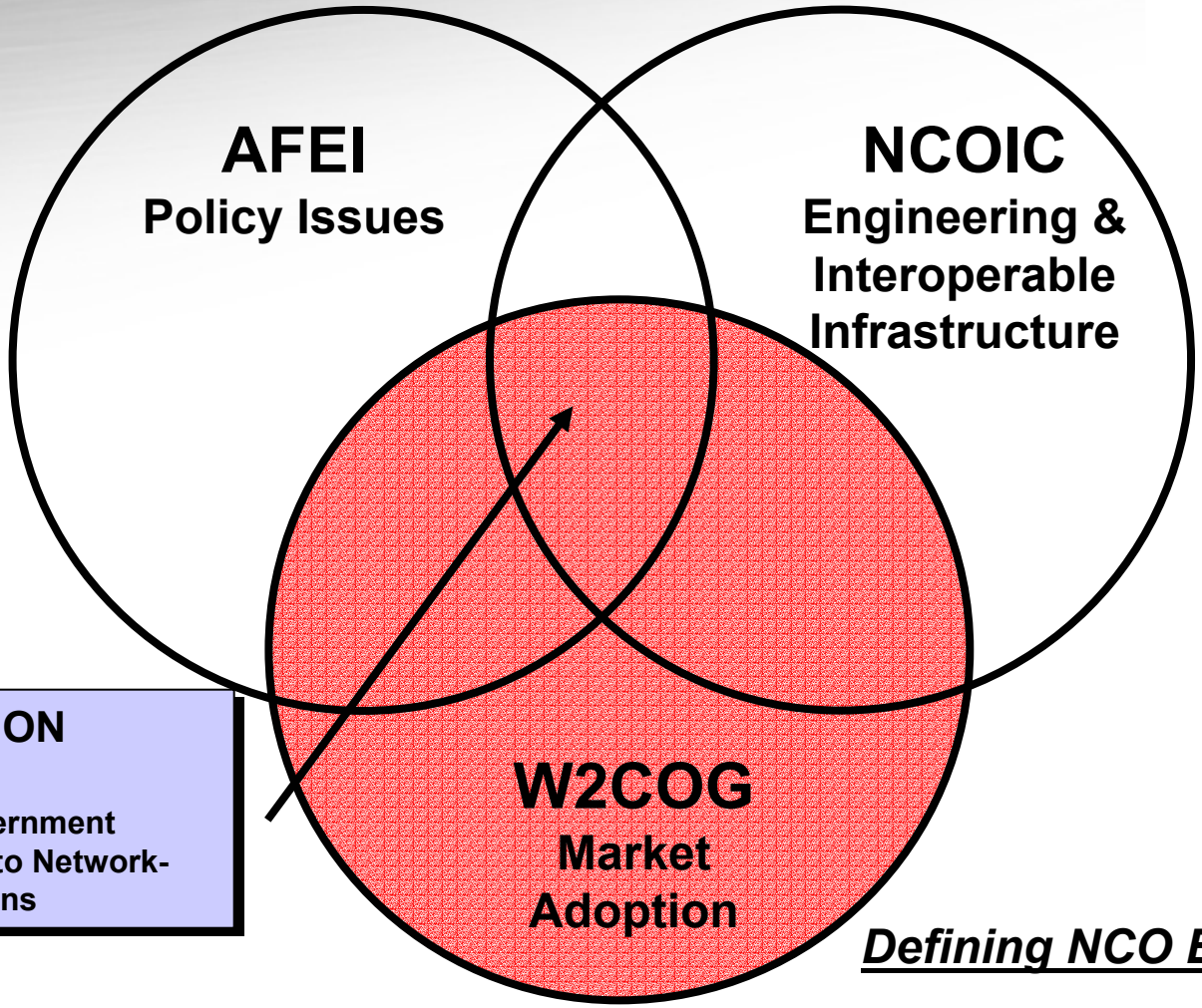
Total Members: 82

Tier 3 Members (57)

- The Aerospace Corporation
- AFEI
- Anteon Corporation
- Argon ST
- Ball Solutions Group
- BearingPoint
- CACI
- Camber Corporation
- CB Technologies
- Ciena Government Solutions
- Cryptek
- Crystal Group
- Cubic Defense Applications
- DataPath
- DCN
- EDISOFT S.A.
- Engenio Information Technologies
- Ericsson
- Finmeccanica
- FlightSafety International
- Honeywell
- INDRA
- Innerwall
- Innovative Concepts, Inc
- Institute for Defense Analyses
- Instrumentointi Oy
- International Data Links Society
- Interoperability Clearinghouse
- Israel Aircraft Industries
- Johns Hopkins University APL
- LynuxWorks
- Marconi Communications Federal
- Maritime Technology Centre R&D Institute
- MBL International, Ltd.
- Microsoft
- MITRE
- Military Communication Institute
- Motorola
- Objective Interface Systems
- OrderOne Networks
- Real-Time Innovations
- Rheinmetall Defence Electronics
- RUAG Electronics
- SAP Labs
- Sikorsky Aircraft
- Smiths Aerospace
- SPARTA, Inc.
- SRI International
- SuprTEK
- Systematic Software Engineering A/S
- Systems Integration & Development
- Terma A/S
- Themis Computer
- University of Maryland, CSHCN
- Wakelight Technologies
- West Virginia High Tech Consortium Foundation
- Wind River Systems

Transformation through Collaboration

Aligning the Sum of the Parts



INTERSECTION SPACE
Successful Government Transformation to Network-Centric Operations

Defining NCO Best Practices

NCOIC Advisory Council

Senior Government Engagement and Advice

Chairman	Dr. Paul G. Kaminski
US Army	Lt Gen Steven W. Boutelle, USA
NGA	Mr. Steven Wallach
Intelligence Community	Mr. Bill Dawson
NATO HQC3S	Maj Gen Georges D'Hollander, Belgian Army
OUSD (AT&L)	Dr. Vitalij Garber
OASD (NII)	Ms. Priscilla E. Guthrie
US Air Force	Lt Gen Michael Peterson, USAF
DHS	Mr. Lee Holcomb
US Navy	VADM James D. McArthur, Jr., USN
USAFA	Gen James P. McCarthy, USAF (Ret.)
At large	Mr. Arthur L. Money
Swedish DMA	Maj Gen (ret) Staffan Näsström
DISA	Lt Gen Charles Croom, USAF
JCS/J6	LTG Robert M. Shea, USMC
NATO ACT	Maj Gen Ruud van Dam, AF Netherlands
JFCOM	LtGen John Wood, USA
NATO C3A	Mr. Dag Wilhelmsen
French MoD	BGen Blandine Vinson-Rouchon
Australian MoD	MAJGEN Mike Clifford
German MoD	Mr. Uwe H. Giesecke

NCOIC / Government Interaction

- Advisory Council
  - Joint Executive Council / Advisory Council meetings
  - Australian and European representation being increased
- Affiliation Relationships
  - OSD OFT
  - NATO ACT
  - W2COG/NPS
- Cooperative R&D Agreements (CRADA)
- NCOIC participation in government activities
  - US Navy Open Architecture Review
  - OSD/NII Net-Centric Implementation Documents (NCID) Review
  - OFT and NDU Education and Outreach Initiatives
  - NATO ACT NEC conference sponsorship/participation
  - NATO C3 Board briefings/contributions
- NCAT Tool approved for use by participants in
  - EUCOM-led Coalition Warrior Interoperability Demonstration (CWID)

Consortium Technical Approach

5 "Parallel" Strategies - Helping our customers to:

- Complete thorough and rigorous analysis of government architectures, capability needs, and mandated standards to identify commonalities, synergies, conflicts, gaps and potential areas for improvement
  - Customer Requirements Team
- Develop a Systems Engineering framework to organize and relate applications, data, and communication elements used by suppliers and system integrators to build and deploy NCO systems
  - Architectures and Standards Analyses Team
- Identify the widest possible community of standards-based product types
  - Building Blocks Team
- Develop a program for education for NCO
  - Education and Outreach Team
- Plan and implement strategies to develop effective collaborative engineering environments
  - Engineering Processes Team

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Enabling Net Centricity - NCOIC's Role

March 14, 2006

Hans W. Polzer, Vice Chair
NCOIC Services and Information Interoperability (SII) WG

Why Net Centricity?

- Greater operational effectiveness for an investment
- Two major paths
  - Improve the asset or system itself (Path A)
    - Training, employment techniques, better performance, multi-mission capabilities, etc.
  - Improve the ability of the asset/system to work synergistically with other assets/systems (Path B)
    - Data Links, “Enterprise” Architectures, Joint Operations, Net Centric Operations, Service Oriented Architectures, etc.
- Path A has been the primary investment path, but
  - Returns on asset performance improvements are decreasing
  - Adoption limited by Increasing asset cost and “globalization” of asset base
- Path B is increasingly the preferred, net centric path to greater operational effectiveness

Operational Effectiveness Enablers

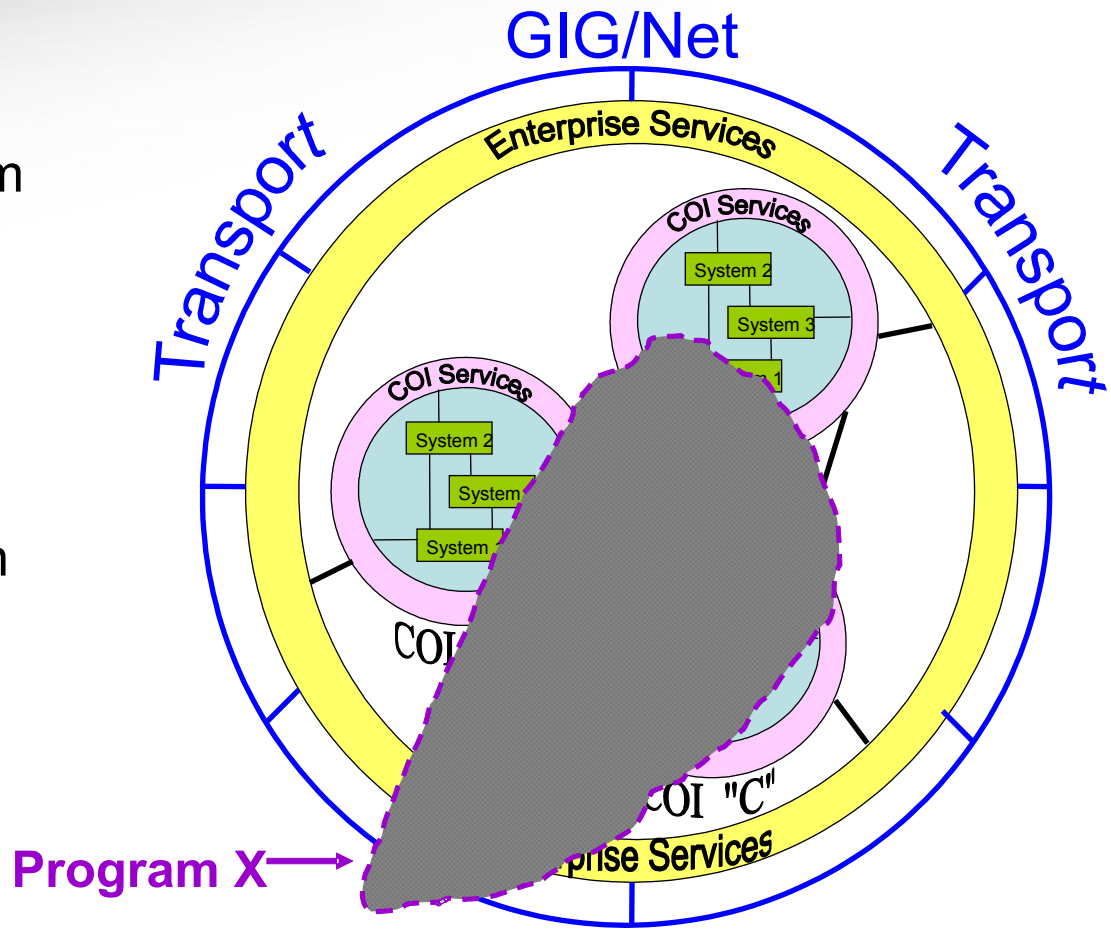
- Pervasive Connectivity
  - GIG, NNEC, Intranets, Internet, Data Links, Sensor Networks
- Service Oriented Architectures
  - Enable interoperation across different hardware/software execution environments
- Net Centricity
  - Adds the notion of dynamic scope and crossing system and enterprise/COI/Domain boundaries via the Net
- Collaborative Culture and Incentives (“Coopetition”); Learning Organizations
  - Enables services to be exchanged on the Net
  - Fosters Social/Collaborative Computing, KM
  - Silicon Valley vs Route 128 Business Model
  - Joint, Coalition perspective rather than just Service or Domain

The Essence of Net Centricity

- More than networks, SOA and NR-KPP
- It's about working with "others" via the pervasive net
- Anticipate and prepare for scope and context changes
- Monitor the environment continuously
- Leverage and share what's available
  - Across program/system boundaries
  - Across capability & domain boundaries
  - Across enterprise & national boundaries
- But prepare to deal with failure/threats
- Mostly a political/business/social model issue
  - Governance within investment/ownership domains
  - Incentive models and risk management between/across investment/ownership domains

A Net Centric Ecosystem Model

- Programs focus on Capabilities (JCIDS)
- Capabilities cut across system and COI boundaries
- Systems support multiple COIs and Capabilities via services
- Services are valued based on how well they support multiple and new Capabilities
- Programs are valued based on how well they create and use Capabilities from multiple services



Summary

- Greater Operational Effectiveness drives Net Centricity
- Net Centricity is more about crossing organizational, asset and domain boundaries than anything else
  - Enabled by the Net
  - Expected by the emerging global culture
- Requires an “Ecosystem” perspective rather than a program-centered view
- Cross-organization institutions needed to foster this
- NCOIC is one such institution

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Technical Role and Value of NCOIC

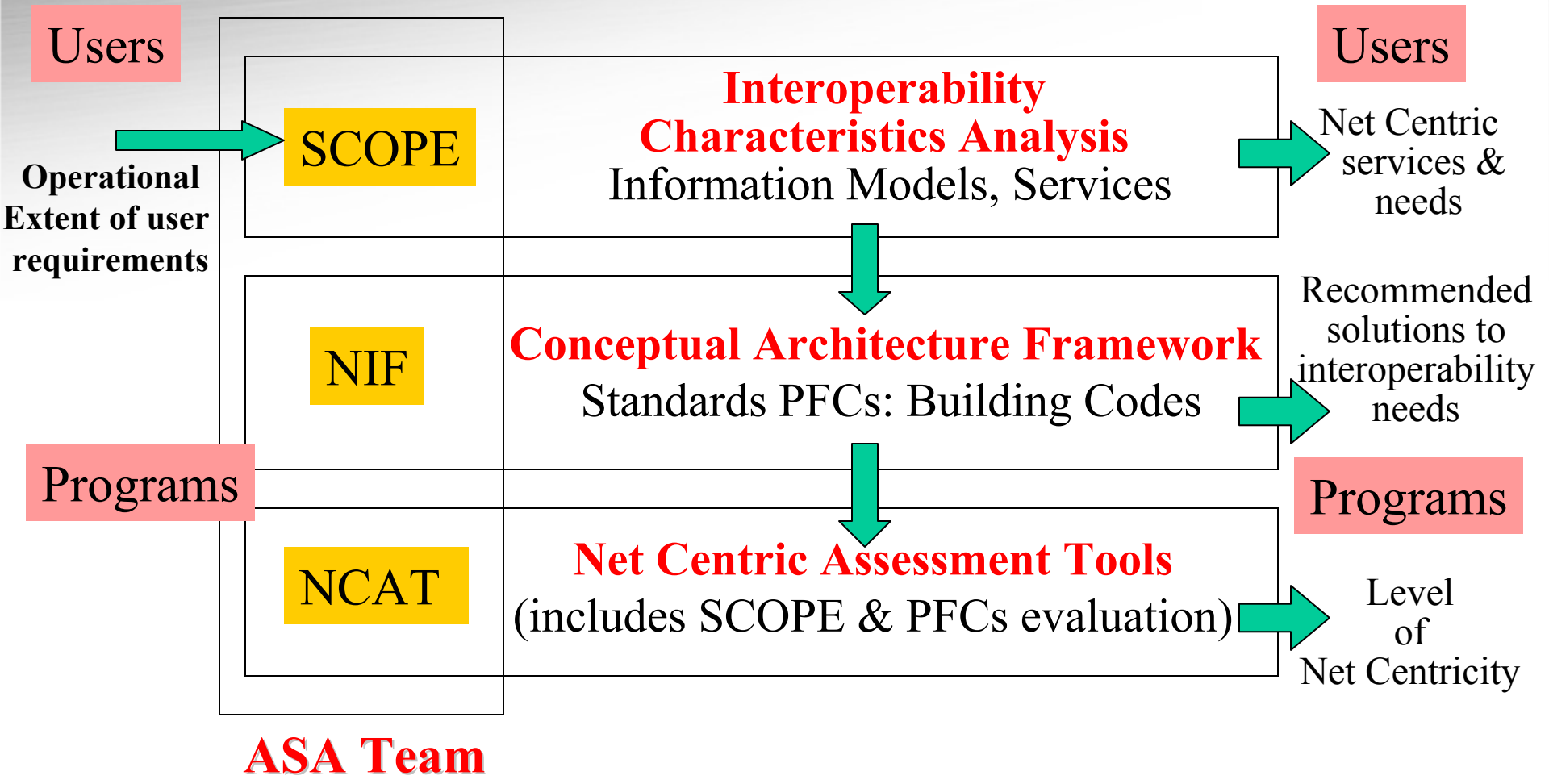
March 14, 2006

Sheryl Sizelove, Vice Chair
NCOIC Technical Council

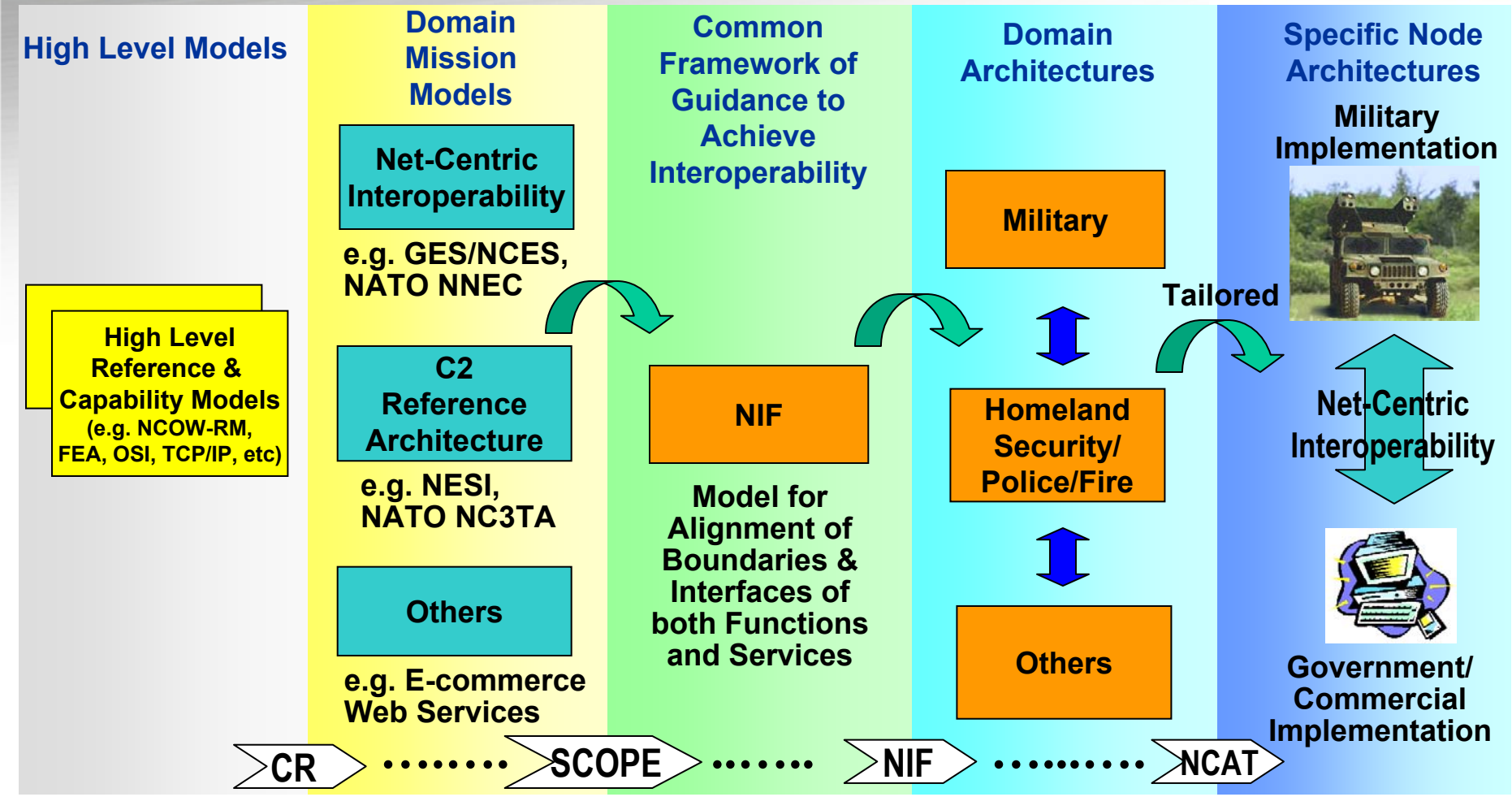
How Does NCOIC Help

- Provides a forum for
  - Understanding the diverse technical perspectives of Net Centricity
    - Ranging from Individual Systems to Global Systems of Systems
  - Exploring the technical consequences of the evolution to Enterprise orientation and Transformational change
    - Political, Social, and Business drivers of technology
- Establishes a cross-organizational institution for developing technical deliverables that help to:
  - Definitize the specific technical nature of interoperability needs for Legacy, Current, and Future System of Systems
  - Recommend solutions to those needs
  - Evaluate how well the resulting designs meet the user's interoperability needs

Interrelationship Between 3 Major NCOIC Technical Deliverables



The Role and Value of the NCOIC



NCOIC Technical Deliverables: Work Breakdown Structure (WBS)

DRAFT 2006-03-10

Building Codes

- NCO Interoperability Framework (NIF)
  - Operational Descriptions
  - Protocol Function Collectors (PFC)
  - Service-Based Model & Components
- Mobility
  - Mobile Network Objectives (MNO)
  - Mobile Network Evaluations (MNE)
- Information Assurance Framework
- Legacy System Integration
- System-Of-Systems Management (Enterprise Service Management)
- Modeling & Simulation Standards

Building Blocks

- CONOPS
- Use Cases
- Product Categorization
- Building Block Database
- Library of Shared M&S Objects

BLACK = In Progress
BLUE = Planned
GREEN = Future

Support Products

- Customer/Industry Initiative Database
- Customer Document Reviews
- Distance Learning Modules
- Lexicon
- Net-Centric Analysis Tool (NCAT)
  - Model Compliance Verification
- Systems Engineering Process Handbook
  - Work Product Management
  - Product/Process Assessment
- Modeling & Simulation
  - Lab Survey
  - Integrated Demonstrations
- Reverse BAA Support
- Interoperability Analyses
  - SCOPE Model & Ontology
  - Interoperability Root Causes & Ontology
  - Net-Centric Tenets & Ontology
- Compliance Evaluation of Products
- Culture Change/Transformation/Human Factors

Liaison

- Affiliates
- Executive/ Advisory Council
- Business Council
- Customer Outreach

Taskings

- Consulting Tasks
- Partnering Tasks
- "Killer Applications"
- etc.

Summary

NCOIC is Serving Government Users

- Addressing the Technical Aspects of Interoperability
  - SCOPE to definitize service and information representation across systems/organizations
    - Details of the technical nature of interoperability needs
  - NIF to align customer domain/COI architectures
    - Recommend solutions to interoperability needs
  - NCAT to measure the fit of systems to those architectures
  - And other Technical Deliverables to serve our Customers

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NCOIC's Technical Position and Vectors

March 14, 2006

Mike Curtis, Chair
NCOIC Technical Council

Where We Are

- NCAT Beta
  - Member Companies
  - Advisory Council Staff
  - EUCOM (CWID, Combined Endeavor)
  - NATO (CWID)
- NCOIC Interoperability Framework
  - Scope Model
  - Service Oriented Architecture
  - Protocol Functional Collections
  - Global Attributes
  - Incorporation of Broad Input

Where We Are

- Technical Working Groups
  - Mobility (MNO, MNE)
  - Information Assurance
  - Services and Information Interoperability
    - (Scope Model, Semantics and Ontology, Tooling)
  - Ground Stations
- Themes
  - Service Oriented Architecture
  - Validation (versus valuation, evaluation, certification ?)
    - PFC's, NCAT, MNE, NIF
  - The Essence of Net Centricity
    - The technical level where common standards and COTS apply
    - The real requirements (necessary for NCO)
  - Non-defense inputs

Where We Are

- Collaborations
  - DOD organizations -- FORCEnet, SPAWAR, Navy OA, AFRL
  - NATO (ACT, NC3A,CWID)
  - US COCOMs (EUCOM, JFCOM [NIPA] …)
  - US OSD (DISA, NII, OFT)
  - Other industry groups (AFEI [NCOIF], W2COG, OMG, TOG…)
  - Many dovetailed technology groups (OGC, AIAA …)
    - From software to satellites
    - and everything else that depends on information

Where We Are Going

- NCOIC is 1.5 years old
  - Technical work is just beginning.
  - 250+ attendees at the last plenary
  - 80 members
  - International recognition as THE forum for NCO
- NCOIC Fellows
- NATO alignment
- Affiliates Council
  - AFEI, W2COG, OMG, TOG, OGC, AIAA +++
  - Common ground to align and coordinate around NCO
  - NCOIC hosts, everyone benefits

Where We Are Going

- Case Studies
  - Sense and Respond Logistics (SRL)
    - NOT just weapon on target
    - End to End integration and flexibility
    - Much relevant commercial experience
  - Complex Humanitarian Disaster (CHD)
    - Cuts across many organizations and resources
    - A wide set of scenarios and focus areas
    - All about collaboration
    - Collaborating with many organizations
- Interoperability Demonstrations
  - NATO, DISA, NII, SDF, member companies

NCOIC Is THE Forum for NCO

Questions or Comments for the Panel?