Net Centric Operations, Interoperability & Systems Integration Conference
Norfolk, VA
"Facilitating Net Centric Operations & Warfare"

21 -24 March 2005

Agenda

Monday, 21 March 2005

Executive Plenary Panel: Achieving Net Centric Operations

Moderator:

- Dr. Glenn Lamartin, OUSD(AT&L) Director, Defense Systems

Panelists:

- COL (P) Susan Lawrence, USA, Acting Vice Director, C4 Systems, JCS J6
- Ms. Priscilla Guthrie, Deputy Assistant Secretary of Defense (Deputy CIO), OASD (NII)/DoD CIO
- LTG Joseph Yakovac, USA, Military Deputy, Assistant Secretary of the Army, Acquisition Logistics & Technology

Mr. John Garstka, Assistant Director, Concepts & Operations, OUSD Office of Force Transformation

Tuesday, 22 March 2005

Panel: JT&E Contribution to Net Centric Operations & Interoperability

Moderator:

- Mr. Michael Crisp, Deputy Director Air Warfare, DOT&E

Panelists:

- Mr. Mike Dorris, SOCOM, DOT&E Joint Test Director for JIISO JT&E Project
- Ms.Geri Lentz, JCMD Tech Director

Panel: Net Centricity: Intelligence and Information Sharing

Moderator:

- Mr.Kevin Meiners, Director of Intelligence Strategies, Assessments and Technology, OUSD(I)

Panelist:

- Mr. Kelly Miller, Director, Unified Crytologic Architecture Office
- Mr. Keith Masback, Deputy Director, Office of Strategic Transformation

Panel: Establishing a Business Mission area in the Department of Defense (DoD)

Moderator:

- Mr Robert Jennings, Assistant Deputy Director, Communications, Business Management Modernization Program (BMMP)

Panelist:

- Mr. Mark Easton, Director, Navy Financial Operations

Panel: The Enterprise Information Environment Portfolio and Information Technology Portfolio Management Initiatives of the DoD CIO.

Moderator:

- Mr. Philip Minor, Director EIE Mission Area, OASD(NII)/DoD CIO

Panelists:

- Mr. Danny Price, Communications Domain Manager, OASD(NII)/DoD CIO
- Ms. Maria Samuda, Deputy Manager, CIO
- Mr. Jerry Hagle, Office of DoD CIO, A&I
- Mr. Tim Bass, Silk Road

Wednesday, 23 March 2005

Panel: Industry Session 1 - Industry Views on NCO/Interoperability

Moderator:

- Mr. C. Stphen Kuehl, AIAA, NCO PC, Raytheon Technical Services Co., LLC

Panelists:

- Mr. Rick Baily, Boeing IDEAS Deputy VP/GM, NCO Lead
- Mr. Jeff Harris, VP and Managing Director, Lockheed Martin ISR Integration
- Mr. Gary W. Claunch , Deputy Director Strategic Planning, C3IS, Northrop Grumman Corporation, Defense Mission Systems Division

Panel: Industry Session 2

Moderator:

- Mr. C. Stphen Kuehl, AIAA, NCO PC, Raytheon Technical Services Co., LLC

Panelists:

- Mr. Dean Cash (MGR), Director of Net Centric Operations
- Mr. Pat Vessels, Director, Strategic Technologies General Dynamics
- Mr. Aaron Budgor, Vice President, Center for Transformation, and Chief Technology Officer BAE Systems

Panel: Implementing the Joint Battle Management Command and Control (JBMC2) Roadmap

Moderator:

- Dr. Vitalij Garber, Director, Systems and Mission Integration, OUSD (AT&L)

Panelists:

- Col Robert A. Gearhart, Jr., USMC, Chief, Integration & Information Assurance Division, Joint Staff (J6I)
- Col Keith Trouwborst., USAF, AF/XII, Air Force JBMC
- Col Harry Dutchyshyn, USAF, JSSEO Director, SIAP

Thursday, 24 March 2005

Opening Remarks & Introductions, by Mr. Alex Urrutia, Director JBMC2

Panel: Initiatives and Operations in a Net Centric Ennvironment in Support of JBMC2 (Session 1 & 2)
Panelists:

- Capt Michael Salvato, USAF, Chief, Netcentric Communications, Capabilities and Integration Division (J68)
- Mr. Ron Park, Northrup Grumman, USAF Langley, C2 &ISR Center Support
- Mr. Troy Turner, Section Head, C41 Standardization & Architectures; Supreme Allied Command Transformation
- COL Edward Hatch, USA, JFCOM J9, Joint Deployment Process Owner (JDPO) Operations in a Net Centric Environment
- Mr. Fred Stein, Mitre, Lead General Systems Engineer, C4ISR Systems Technology, JFCOM J9 Directorate
- Mr. John Wellman, JFCOM J8, Joint C2 Operations in a Net Centric Environment
- MAJ Edward McLarney, USA, JFCOM J9, Jint Experiementation Net Centric Initiatives with CENTCOM
- Mr. Alex Urrutia, USJFCOM, J8 JI&JBMC2

Net Centric Operations, Interoperability & Systems Integration Conference

Facilitating Net Centric Operations & Warfare

Agenda & Call for Displays

March 21-24, 2005

Norfolk Waterside Marriott, Norfolk, VA

Event # 5120

With Technical Co-sponsorship by
The American Institute of Aeronautics & Astronautics (AIAA)

In conjunction with

Office of the Under Secretary of Defense,
Acquisition Technology & Logistics (OUSD/AT&L),
Office of the Assistant Secretary of Defense, Networks & Information Integration/DoD Chief Information Officer [ASD(NII)/DoD CIO],
United States Joint Forces Command (USFJCOM)

AGENDA

Sunday, March 20

4:00PM-6:00PM Registration

Monday, March 21

7:00AM-5:30PM Registration

8:00AM-12:00PM Tutorial, sponsored by AIAA
*There is an additional cost for this tutorial

Tutorial: Mainstreaming NCO – Policies, Technologies, and Operations against a Real World Telecommunications Perspective

This AIAA-sponsored tutorial will examine how we can go about bringing NCO concepts into reality by drawing from the real-time data exchange experience of the entertainment and information industries. AFEI and NCOIC will provide the policy and technical service-oriented architecture perspectives that we face in the industry with legacy systems, followed by a DoD operational viewpoint on establishing common operating pictures that make the difference in the war on terrorism. A panel will wrap up the session with a lively exchange of information and observations with audience Q & A participation.

Moderator: Mr. C. Stephen Kuehl, AIAA NCO PC Chairman, Raytheon

Session Coordinator: Mr. Tim Howard, AIAA NCO Program Committee

8:00AM Introduction of Topic
Mr. C. Stephen Kuehl, AIAA NCO PC Chairman, Raytheon

8:05AM DoD NCO Policy Perspectives - Strategies for Net Centric Data, Directives for the Service-oriented Enterprise, Mandates for Assuring Security
Mr. Dave Chesebrough, President, AFEI

Moderator*:* Ms. Judy L. Smith, Principal, Booz Allen Hamilton

Panelists:
Mr. Jeff Miller, Senior Associate, Booz Allen Hamilton

Mr. Tom Fuhrman, Principal, Booz Allen Hamilton

Mr. Greg Wenzel, Principal, Booz Allen Hamilton

9:35AM Break

9:45AM	NCO Technical Approach in terms of the agenda subject. To include presentations on NCO Technical Perspective - Open Standards?; Understanding Open Standards Frameworks, Patterns and Tools to Meet NCO Needs; NCO on the Move: A Concept for Mobile Users ***Moderators:*** Ms. Sheryl Sizelove, Director NCO Architecture Engineering, Boeing and Mr. Dave Shaw, Global Busniss Analysis **Panelists:** Mr. Ken Cureton, Boeing Mr. Hans Polzer, Senior Manager, System of Systems Engineering, Lockheed Martin Mr. Frank Miller, Principal Systems Engineer, Networking Technology Rockwell Collins
11:15AM	Break
11:25AM	Question and Answer Session with all Tutorial Speakers
12:00PM	Tutorial Ends
12:00PM	Lunch on your own
1:30PM	Conference Welcome Mr. Sam Campagna, Director, Operations, NDIA
1:35PM	Conference Opening Mr. Bob Rassa, Director, Sytem Supportability, Raytheon Space & Airborne Systems
1:40PM	**Executive Plenary Panel:** Achieving Net Centric Operations **Moderator***:* Dr. Glenn Lamartin, OUSD(AT&L) Director, Defense Systems **Panelists:** LTG Robert Wagner, USA, Deputy Commander, USJFCOM COL (P) Susan Lawrence, USA, Acting Vice Director, C4 Systems, JCS J6 Ms. Priscilla Guthrie, Deputy Assistant Secretary of Defense (Deputy CIO), OASD(NII)/DoD CIO LTG Joseph Yakovac, USA, Military Deputy, Assistant Secretary of the Army, Acquisition Logistics & Technology

	Mr. John Gartska, Assistant Director, Concepts & Operations, OUSD Office of Force Transformation
3:15PM	**Break**
3:30PM	**Executive Plenary Panel Continued**
5:00PM	Adjourn
5:00PM – 6:00PM	Opening Reception, Display Area

Tuesday, March 22

7:00AM-5:15PM	Registration
7:00AM-7:45AM	Continental Breakfast
7:45AM	**Panel:** JT&E Contribution to Net Centric Operations & Interoperability The panel presentations will include an overview of DOT&E's Joint Test and Evaluation (JT&E) Program and provide highlights of Joint Integration & Interoperability of Special Operations (JIISO), Joint Cruise Missile Defense (JCMD), and Joint Datalink Information Combat Execution (JDICE) JT&E projects and how each contributes to improving Net Centric Interoperability. **Moderator:** Mr. Michael Crisp, Deputy Director Air Warfare, DOT&E **Panelists:** Mr. Mike Doris, SOCOM, DOT&E Joint Test Director for JIISO JT&E Project Ms. Geri Lentz, JCMD Tech Director Col Billy Gilstrap, USAF, DOT&E Joint Test Director for JDICE JT&E Project
9:30AM	**Conference Keynote** ADM Edmund P. Giambastiani, USN, Commander, US Joint Forces Command
10:15AM	**Break**
10:30AM-12:15AM	**Panel:** Net Centricity: Intelligence and Information Sharing This panel will discuss an integration process for ISR systems. The process begins with a DoD strategy and concludes with the Military Services implementing a common

	architecture. The DCGS Integration Backbone (DIB) forms the basis of the integration framework and is used as a thread woven through the three presentations. The audience will hear how the Department is moving beyond technical interoperability to the vision of net- centricity. The strategy for integration consists of a two step process: a Core Services (CS) and a strong governance. **Moderator:** Mr. Kevin Meiners, Director of Intelligence Strategies, Assessments and Technology, OUSD(I) **Panelists:** Col Vince Snyder, USAF, Systems Program Director, Intelligence, Surveillance & Reconnaissance Integration SPO Mr. Kelly Miller, Director, Unified Crytologic Architecture Office Mr. Keith Masback,Deputy Director, Office of Strategic Transformation
12:15PM	Lunch **Luncheon Speaker**: Dr. Margaret Myers, Principal Director, ODASD(DEP CIO), ASD(NII)/DoD CIO
1:45PM-3:30PM	**Panel:** Establishing a Business Mission Area in the Department of Defense (DoD): The Benefits of Business Collaboration and Standardization. Panelists will discuss the purpose and benefits of the Business Mission Area across all elements of the DoD, to include Governance, business transformation, and interoperability. **Moderator:** Mr. Robert Jennings, Assistant Deputy Director, Communications, Business Management Modernization Program (BMMP) **Panelists:** Dr. Paul A. Tibbits, Director, BMMP Mr. Paul Brinkley, ADUSD (Logistics System Management Office), OUSD(AT&L) Mr. Mark Easton, Director, Navy Financial Operations
3:30PM-3:45PM	Break
3:45PM-5:30PM	**Panel:** The Enterprise Information Environment Portfolio and Information Technology Portfolio Management Initiatives of the DoD CIO.

Senior OSD officials representing the DoD Deputy CIO, EIE Mission Area and EIEMA Domains will discuss the background and objectives of the Defense Department's IT portfolio management initiatives and the scopes and processes being established by the DoD-CIO led EIE Mission Area and EIEMA Domains, which include Communications, Computing Infrastructure, Core Enterprise Services and Information Assurance

Moderator: Mr. Philip Minor, Director EIE Mission Area, OASD(NII)/DOD CIO

Panelists:
Mr. Danny Price, Communications Domain Manager, OASD(NII)/ DOD CIO

Mr. Michael Casey, Computing Infrastructure Domain Manager, OASD(NII)/DOD CIO

Ms. Irene Navarro, Core Enterprise Services Domain Manager, OASD(NII)/DOD CIO

Ms. Glenda Turner, Information Assurance Domain Manager, OASD(NII)/DOD CIO

5:30PM-7:00PM Reception, Display Area

Wednesday, March 23

7:00AM-5:15PM Registration

7:00AM-8:00PM Continental Breakfast

8:00AM-9:45AM **Panel:** Industry Session 1- Industry Views on NCO/ Interoperability

The Industry sessions will provide comments, observations and suggestions from key senior representatives from the Defense Industry on their views of the steps needed to achieve true Net Centric Operations and Interoperability.

Moderator: Mr. C. Stephen Kuehl, AIAA, NCO PC, Raytheon Technical Services Co., LLC

Panelists:
Mr. Rick Baily, Boeing IDEAS Deputy VP/GM, NCO Lead

Mr. Jeff Harris, VP and Managing Director, Lockheed Martin ISR Integration

	Ms. Christine Reynolds, Vice President, C3I Systems Operation, Defense Mission Systems Division, Mission Systems Sector, Northrop Grumman Corporation
9:45AM	Break
10:00AM-10:45AM	VADM Stanley Scemborski, USN
10:45-12:30PM	**Panel:** Industry Session 2
	Moderator: Mr. C. Stephen Kuehl, AIAA, NCO PC, Raytheon Technical Services Co., LLC
	Panelists: Mr. Dean Cash (MGR), Director of Net Centric Operations Enterprise Priority, Raytheon Net Centric Systems
	Mr. Pat Vessels, Director, Strategic Technologies General Dynamics
	Mr. Aaron Budgor, Vice President, Center for Transformation, and Chief Technology Officer BAE Systems
12:30PM	Lunch
1:30PM-5:15PM	**Panel:** Implementing the Joint Battle Management Command and Control (JBMC^2) Roadmap
	Moderator: Dr. Vitalij Garber, Director, Systems and Mission Integration, OUSD(AT&L)
	Panelists: Maj Gen Charles Simpson, USAF, JFCOM J8, RM Overview
	Col Robert A. Gearhart Jr., USMC, Chief, Integration & Information Assurance Division, Joint Staff (J6I)
	BG(p) Jeff Sorenson, ASAALT, Army G8, Army JBMC^2
3:15PM-3:30PM	Break
	Panel: Implementing the Joint Battle Management Command and Control (JBMC^2) Roadmap (Continued)
	Panelists: Col Keith Trouwborst, USAF, AF/XII, Air Force JBMC^2
	RADM Andy Singer, USN

Col Harry Dutchyshyn, USAF, JSSEO Director, SIAP

Thursday, March 24

8:00AM-8:10AM Opening Remarks & Introductions Mr. Alex Urrutia, Director JBMC^2

8:10AM-9:45AM **Panel:** Initiatives and Operations in a Net Centric Environment in Support of JBMC^2 (Session 1 & 2)

Initiatives and Operations Panel Continued
Panelists will brief initiatives and operations in a Net Centric environment in support of JBMC^2 with highlights of the JBMC^2 Data Strategy Implementation Community of Interest (COI) with details on a Time Sensitive Targeting (TST) COI. In addition, coalition Net Centric initiatives in Multi National Information Sharing (MNIS) and initiatives by the Allied Command Transformation (ACT) will be covered. JDPO, JUO, JC2 and MNIS/CENTCOM Operations in a Net Centric Environment will then be discussed.

Panelists:
Capt Michael Salvato, USAF, Chief, Netcentric Communications, Capabilities and Integration Division (J68)

Mr. Ron Park, Northrup Grumman, USAF Langley, C2 & ISR Center Support

Mr. Troy Turner, Section Head, C41 Standardization & Architectures; Supreme Allied Command Transformation

9:45AM-10:00AM Break

10:00AM-11:45AM **Panelists:**
COL Edward Hatch, USA, JFCOM J9, Joint Deployment Process Owner (JDPO) Operations in a Net Centric Environment

Mr. Fred Stein, Mitre, Lead General Systems Engineer, C4ISR Systems Technology, JFCOM J9 Directorate

Mr. John Wellman, JFCOM J8, Joint C2 Operations in a Net Centric Environment

MAJ Edward McLarney, USA, JFCOM J9, Joint Experimentation Net Centric Initiatives with CENTCOM

12:00PM Conference Adjourns

Conference Chair

Mr. Bob Rassa, Raytheon

Conference Technical Program Chairs

Mr. Jack Zavin, OASD(NII), Mr. Alex Urrutia, JFCOM, and
Ms. Robin Quinlan, OUSD(AT&L), Mr. C. Steve Kuehl, AIAA NCO PC
Chairman (Raytheon Technical Services, Co., LLC)

NDIA/AIAA
Interoperability & System Integration Conference

Industry Session
March 2005

Rick Baily
The Boeing Company

“Start With The End In Mind”

- **Shared situational awareness**
- **Speed and agility of “Battle Command”**
- **Dynamic “Battle Execution”**

Hours → **Minutes** → **Seconds**

Capability Needs Driven by Changing Environment

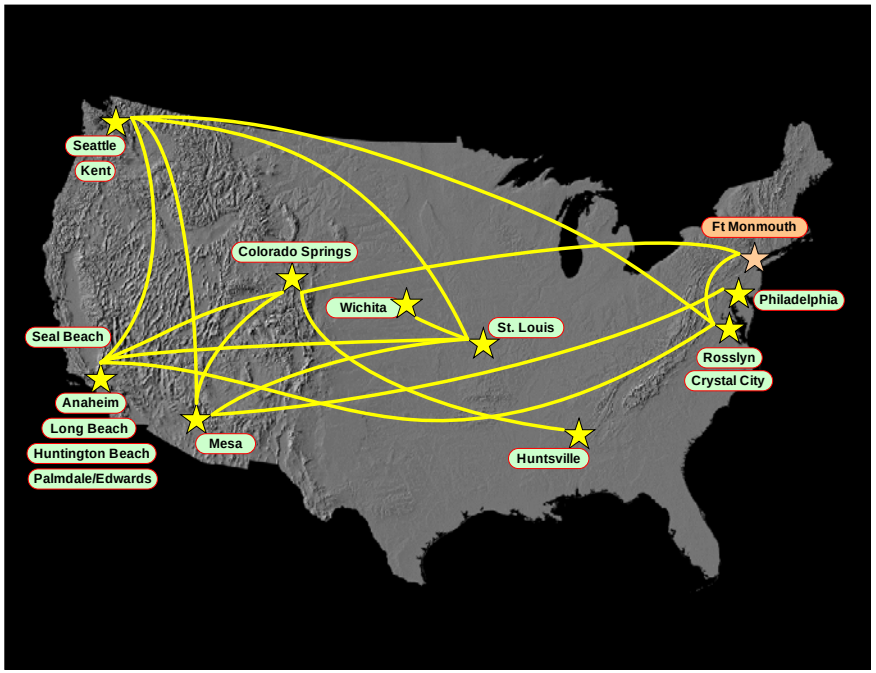
Environment Trends	Capability Need
Complex, dispersed operating environments	**Everything part of network**
Integrate varied set of capabilities from broad group of "mission partners" (interdependence) **IT-savvy adversaries that appreciate "asymmetry" of network attacks**	**Seamless, secure information flow**
Very dynamic employment to respond to rapid changes in environments	**Right Quality of Service to "the edge"**

Net-centric capabilities enable transformation to network centric warfare

Filling Capability Needs

- **Everything in the network**
  - Communications and avionics block upgrades
  - Data translations services
  - IP designed into all new systems
- **Seamless, secure information flow**
  - Seamless information management
  - Information Assurance: Defense-in-Depth
- **Right QoS to "the edge"**
  - High bandwidth tactical ad-hoc mobile communications
  - Laser communications and high bandwidth RF relays
  - QoS management extended to information management layer

Current Experience Example ……. Fixed and Mobile Networks



Boeing LABNET – real time collaborative simulations

Mobile, ad-hoc network demonstration

Harsh mobile tactical warfighting environment
<u>not</u> like fixed infrastructure – requires different solutions

Provocative Statement #1

In focusing on "enterprise" interoperability, we are not adequately addressing the tactical regime

We need seamless, secure information flow from enterprise to tactical levels

Interoperability Isn't……..

Your old phone system ……..

Systematic Approach to Net-Centric Interoperability

- **Not all systems need same level of interoperability capability**
  - But all must have same basic minimum capability
- **Each system has a desired interoperability capability**
  - Determined by intended missions of the system
- **Metrics indicate system maturity toward the desired level**
  - Most significant indicator for high-level decision makers
  - Metrics and scores for identifying gaps and guiding implementation

Interoperability Requirements Reflect Varying Types of NCO Activities

Can send and receive some data

Data exchange and some fusion capability / complex node activity

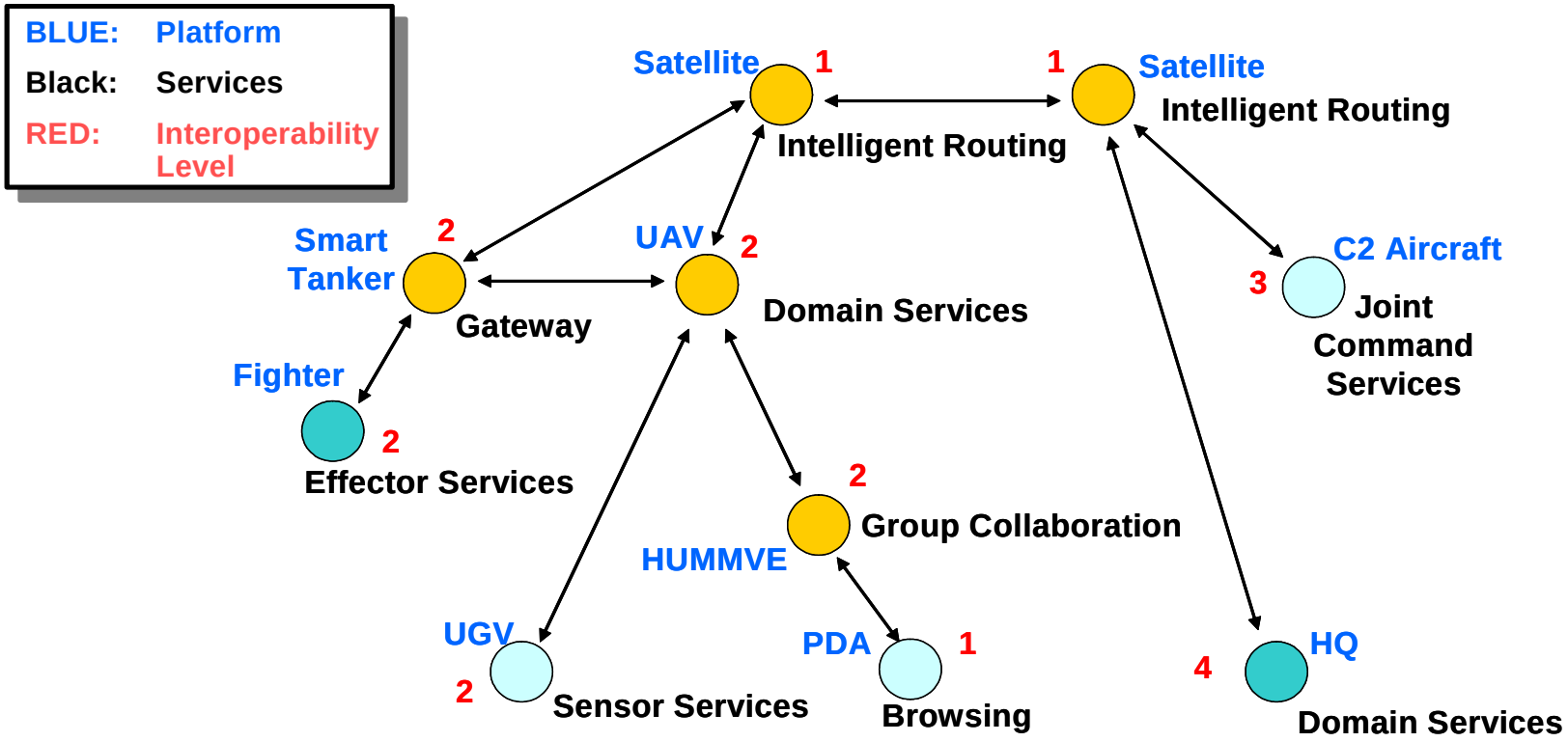
Fusion capability and multi-node tasking giving it area C2 capability

Extension fusion capability / theater-wide operational control

No Generic Interoperability — ***Minimum*** **Level 1** ····· ***LEVEL OF INTEROPERABILITY*** ····· ***Maximum*** — **Level 2** — **Level 3** — **Level 4**

Dissimilar Nodes Interoperating

Interoperability Levels Based On Mission Needs



Minimum Level of Interoperability

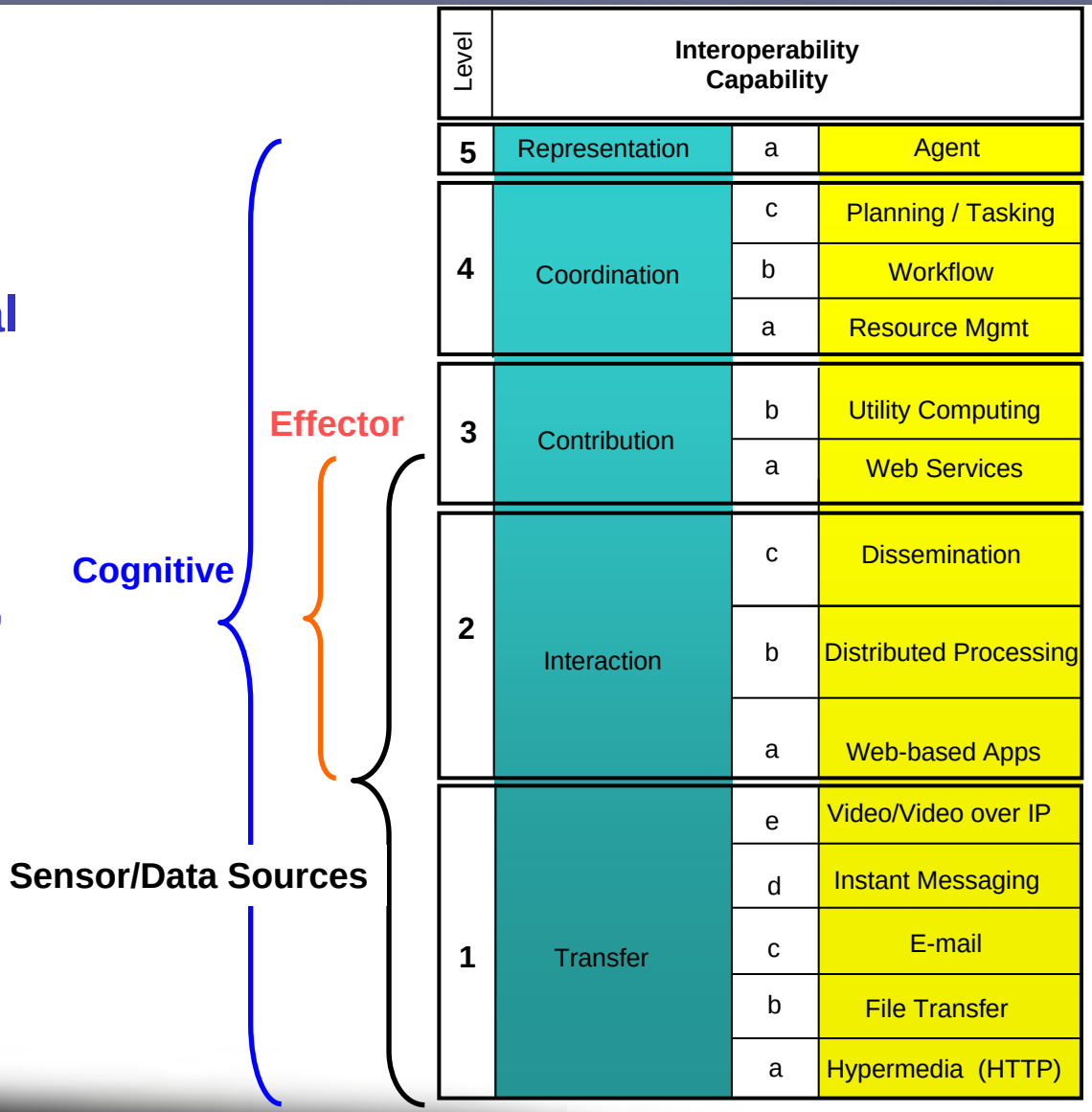
- **MLI requirements are simple and implementable in most information systems**
  - Discover communications network
  - Connect to an IP network
  - Register and discover services (in a mobile ad hoc environment)
  - Can transmit and receive data
- **MLI requirements flow down to each attribute**

Attribute	Requirements
Service Oriented	Use of community registry for service discovery
Data Semantics	Use of community XML Schemas in data exchanged
Info Assurance	Adherence to Common Criteria EAL
End-to-end QoS	Support for Service Level Agreements
Info Management	WS-I Basic Profile Standard compliant
Transport	Link to an IP network

MLI
Can receive and transmit data

Reference Model Provides Structure For Analysis

- Requirements based on mission needs
- Model breaks down needs into defined capabilities and technical functionality
- Boeing reference model called “Levels of Information Interoperability for NCO” (LIINCO)
- Consistent with USAF maturity model being developed (SISSU/LISI-based)



Provocative Statement #2

We can't rely on "web-services" for solving all interoperability capability needs

We need interoperability and performance met at enterprise to tactical levels – we'll need a blend of solutions

Roadmap To Interoperability

Application Integration

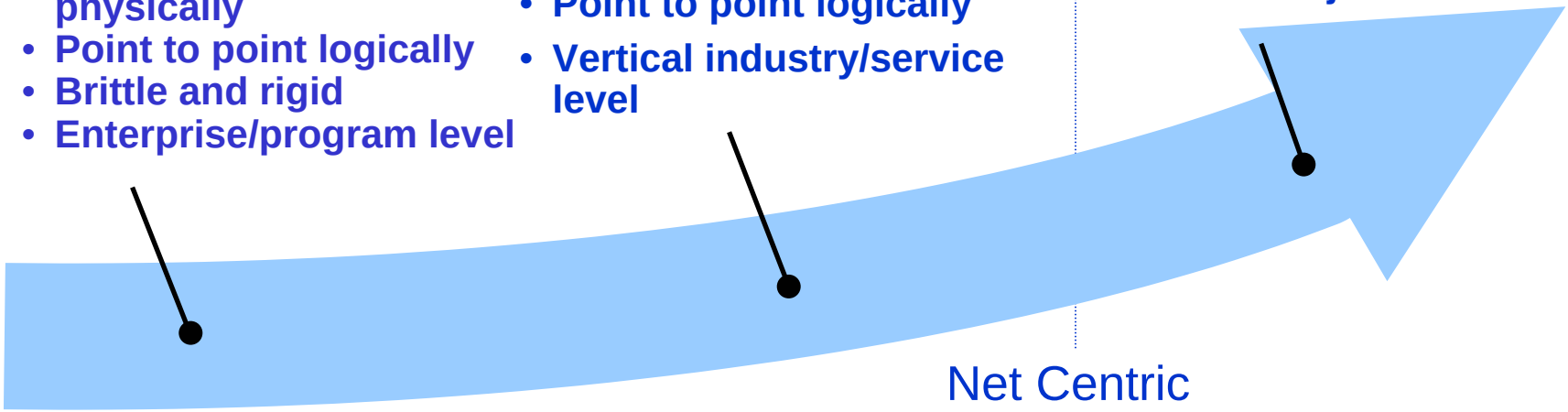
- IER based
- Hard coded interfaces (syntax & structure)
- Tightly coupled physically
- Point to point logically
- Brittle and rigid
- Enterprise/program level

Service Integration

- Service oriented
- Std. schemas & interfaces
- Discovery of services
- Loosely coupled physically
- Point to point logically
- Vertical industry/service level

Semantic Services

- Ontology based
- Semantic mediation
- Semantic mapping
- Context sensitivity
- Global/joint level



1990s

2000s

Net Centric Environment

2020s

LIINCO is an NCO Enabler Today . . .
a Bridge to Semantic Services for Tomorrow

Interoperability Recommendations

- Let's work solutions that seamlessly and securely create information flow across all levels – let's not leave out tactical/mobile environment
- Let's work together to adopt a "target value" interoperability model focused on mission needs - not "more is better"
- Let's assure our solutions meet interoperability and performance – augment web-services where required

Draft v5

NDIA Conference on Net-Centricity and Interoperability

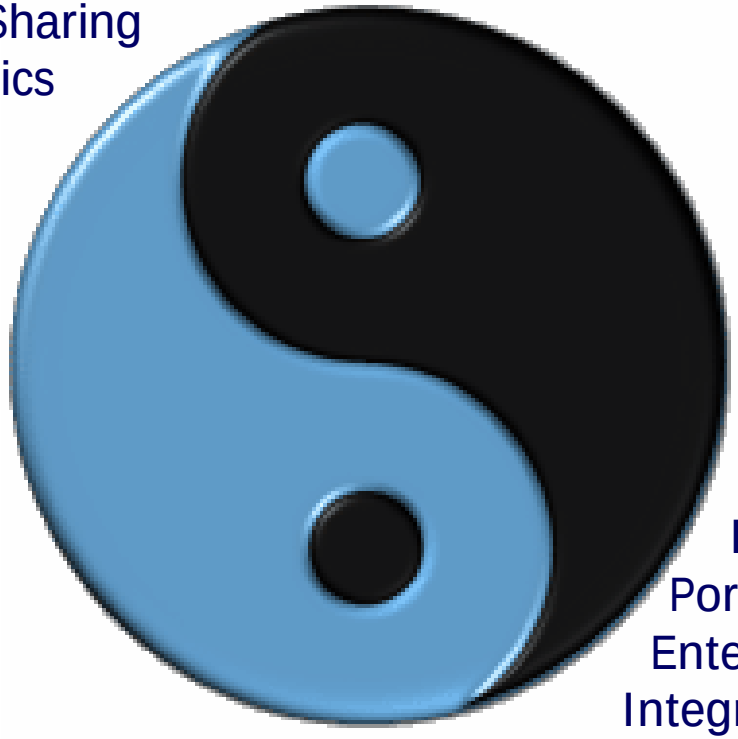
15 Minute Outline

- **Introduction**
  - The Yin and Yang of IT Portfolio Management
  - Net-centricity and CPIC
- **Net-Centric Thinking**
  - Characterized by market forces and cooperation
  - Agility, speed of command, self-synchronization
- **Capital Planning and Investment Control Thinking**
  - Characterized by top down planning & controls
- **Lessons Learned from Classical Game Theory**
  - The Prisoner's Dilemma and Cooperation
  - Information Sharing vs. Information Hoarding
- **Net-Centric Strategic Challenges**
  - A Few of the $50 Billion Dollar Questions
- **Questions from Attendees**

The Yin and Yang

Net-centricity and CPIC

Service-Oriented Architectures
Information & Data Sharing
Evolutionary Economics
Self-Synchronization
Speed of Command
Sense and Respond
Self-Organization
Market Forces
Net-Centricity
Capabilities
Agility



Top Down
Consolidation
Capital Planning
Investment Control
Portfolio Management
Enterprise Architecture
Integrated Architectures
Federal Enterprise Architecture
President's Management Agenda

Net-Centric Thinking

"What we would like to enable."

Characterized by:

- Market forces, customer satisfaction, information sharing, sense and respond networking, evolution, natural selection, market economics, and capabilities-based.

- Speed of command, agility, sense-and-respond logistics, cooperation, dynamic interactions, self-organization, and self-synchronization.

CPIC Thinking

"What we must deal with in the real world."

Characterized by:

- Political goals and objectives, political oversight, military-industrial complex, quid-pro-quo, consolidation and command economics.

- Lack of agility, lack of cooperation, slow, rigid interactions, turf protection, information hoarding, and self-preservation.

The Prisoner's Dilemma**

"Basic Idea of Cooperation from Classical Game Theory."

	Jones Confesses ("Defection")	Jones Remains Silent ("Cooperation")
Smith Confesses ("Defection")	**Smith and Jones get 5 years each.**	**Jones get 10 years.** **Smith goes free.**
Smith Remains Silent ("Cooperation")	**Smith get 10 years.** **Jones goes free.**	**Smith and Jones get 1 year each.**

** In classical game theory, a situation in which two players must choose between the risks of cooperation and competition as equated with two prisoners separately deciding whether to confess to a crime. Naturally, the "payoffs" gets more complex as the number of participants increases.

The Prisoner's Dilemma**

"IT Lessons Learned from Classical Game Theory."

	Organization "A" Hoards Information ("Defection")	Organization "A" Shares Information ("Cooperation")
Organization "B" Hoards Information ("Defection")	**"A" and "B" get $5M of funding each.**	**"B" get $10M of funding.** **"A" gets zero.**
Organization "B" Shares Information ("Cooperation")	**"A" get $10M of funding.** **"B" gets zero.**	**"A" and "B" get $3M of funding each.**

** In classical game theory, a situation in which two players must choose between the risks of cooperation and competition as equated with two prisoners separately deciding whether to confess to a crime. Naturally, the "payoffs" gets more complex as the number of participants increases.

Net-Centric Strategic Challenge

"How do we facilitate cooperation and sharing?"

The $50 Billion Dollar Questions

How can CPIC processes evolve to facilitate cooperation and information sharing in a world where "defection" and information hoarding has a "bigger payoff" ?

Net-Centric Strategic Challenge

"How do we facilitate cooperation and sharing?"

The $50 Billion Dollar Questions

Can and should DoD shift from system-based IT acquisition to information-based IT acquisition ?

Information-Based Acquisition

"What is information-based acquisition?"

Concept Exploration

- DoD specifies information requirements, not systems requirements.
- DoD acquires information versus IT systems.
- DoD information service providers compete in an information marketplace, not a systems marketplace.
- Like other "free markets," supply-and-demand for information drives the economics of CPIC.
- Many information service providers of high quality information results in lower acquisition costs.
- Innovation and niche production are encouraged in the "new information economy."

Net-Centric Strategic Challenge

"How do we facilitate cooperation and sharing?"

The $50 Billion Dollar Questions

What would an information-based approach "look like" and how would it effect CPIC processes ?

Net-Centric Strategic Challenge

"How do we facilitate cooperation and sharing?"

The $50 Billion Dollar Questions

What are other lessons we can use and apply from cooperative game theory to the "yin and yang" of CPIC processes and our net-centric goals and objectives ?

Net-Centric Strategic Challenge

"How do we facilitate cooperation and sharing?"

Questions from
Conference Participants

Draft v5

NDIA Conference on Net-Centricity and Interoperability

The Yin and Yang of IT Portfolio Management

Prepared by
Tim Bass
www.silkroad.com
bass@silkroad.com

22 March 2005

BAE SYSTEMS

Systems of Systems Considerations in NCO

NDIA Net Centric Operations, Interoperability and Systems Integration Conference

Aaron Budgor

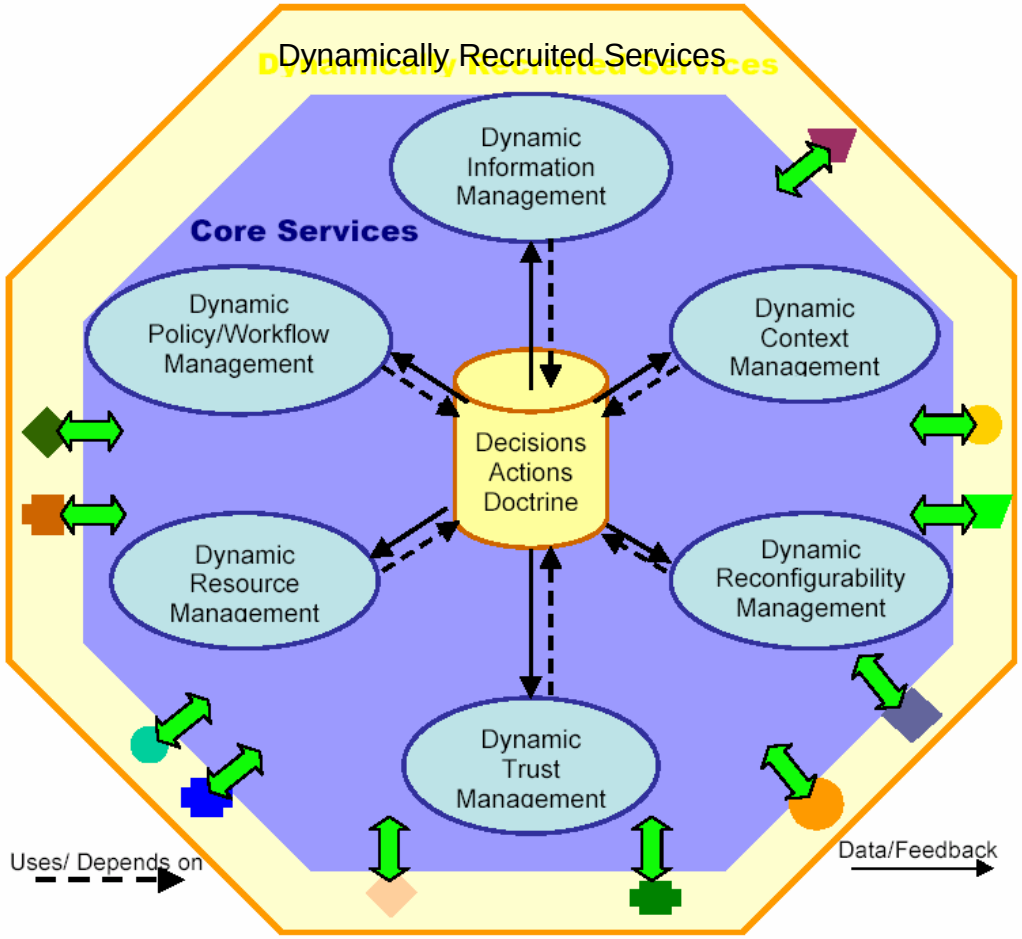
BAE SYSTEMS

23 March 2005

Technology Breakthroughs Needed

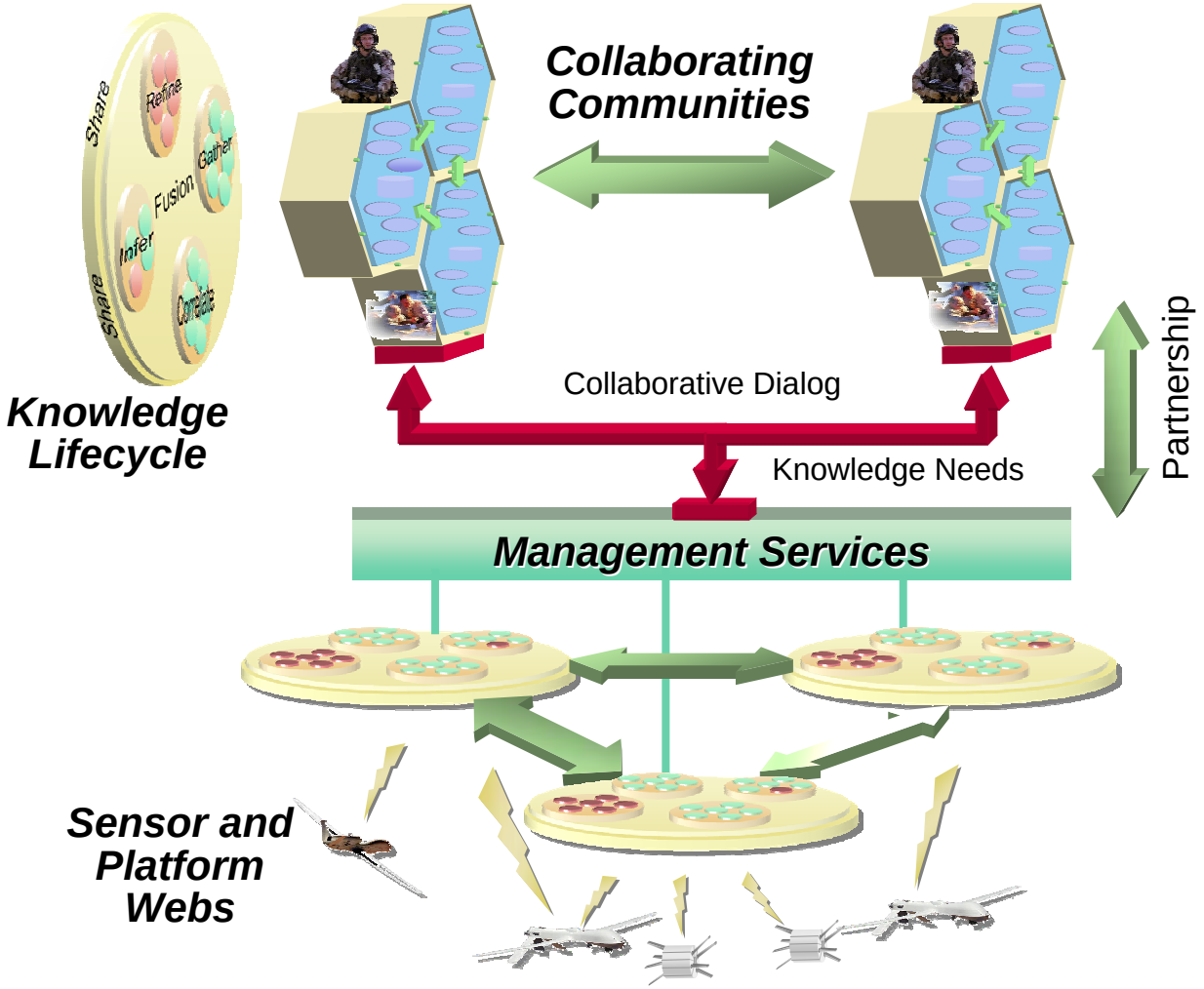
BAE SYSTEMS

- Dynamic Information Management
- Dynamic Policy Management
- Dynamic Context Management
- Dynamic Trust Management
- Dynamic Resource Management
- Dynamic Reconfigurability



NCO CONOPS – How Might this Work?

BAE SYSTEMS



Convert observations into actionable, responsive knowledge

Enable users to dynamically form around knowledge production, leveraging shared expertise

Broker observations across peer groups of sensors and platforms

Optimize sensors and platforms to dynamically address observation tasks

Unified Cryptologic Architecture (UCA)

for
NDIA Net-Centric Operations Conference

22 March 2005

UCA Value Proposition

- Under DIRNSA's Community Functional Lead for Cryptology authority, the UCA needs to describe how we work together as an integrated team – establishing an overall DoD SIGINT Architecture.
- The UCA must establish collective practices and promote coordinated efforts.
- The UCAO needs to exercise cross-service oversight of joint intelligence, surveillance and reconnaissance SIGINT activities.

Derived from HPSCI Markup Language

UCAO

- Community office focused on exercising DIRNSA CFL for Cryptology responsibilities
- Comprised of 9 Partners:

NSA/CSS	Air Force	Marine Corps
NRO	Army	Navy
DIA	Coast Guard	
CIA		

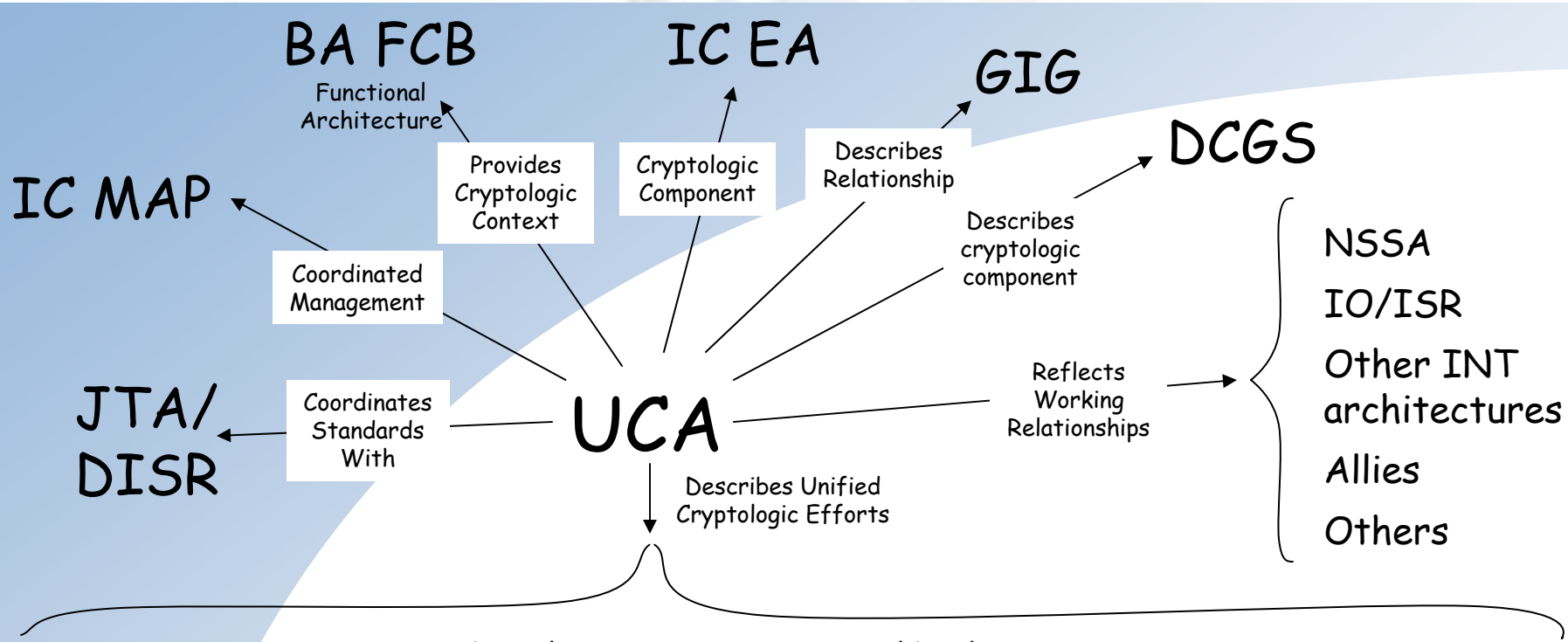
- Dual role/responsibilities as NSA/CSS Engineering Directorate

UCAO | DE
Unified Cryptologic Architecture Office
NSA/CSS Directorate of Engineering

Objectives

- Promote a **common architectural construct** for our collective cryptologic capabilities
- Establish a **common language and taxonomy** for describing and analyzing these capabilities
- Demonstrate our collaborative efforts to produce **unified cryptologic capabilities**
- Provide information environment that enables **informed** operational, management, technical and investment **decisions**
- **Promote unity** while respecting individual autonomy
- Represent a **unified cryptologic front** to external entities
- Establish uniform architecture review and approval procedures

UCA Relationships



UCAO | DE
Unified Cryptologic Architecture Office
NSA/CSS Directorate of Engineering

Promotes

- Unified Operations
- NSA/CSS Transformation
- Net Centric Operations
- Horizontal Integration
- Multi-Int Integration
- Distributed Cryptologic Operations
- System of Services
- Sharing Data as a Default Position

Through

- UCS CONOP
- Allocated Requirements
- Integrated Architecting Teams
  - UCA NSA/CSS ACA AFCA MCA
- Integrated Processes/Products
  - Data Modeling WIPT
  - Service Reference Model WIPT
  - UCA TV
  - GIG IA Architecture
- Coordination with:
  - IC
  - DoD
  - Allies

DCGS Specific

- UCA and related architecture efforts will describe the Cryptologic component of DCGS
- SIGINT Customer
- Cryptologic Partners
  - Service Cryptologic Architectures
    - Defining Operational Relationships
    - Developing Business Models
    - Capturing Data Flows
    - Common Data Models
    - Documenting Interfaces
    - Applying Standards

Questions

?

Larry Carroll
SID Technical Lead Horizontal Integration
ldcarro@nsa.gov
ldcarro@nsa.ic.gov
443-479-5868

Curtis Mitchell
UCAO/DE Architecture Portfolio Manager
cemitch@nsa.gov
cemitch@nsa.smil.mil
cemitch@nsa.ic.gov
301-688-3955/44

Success Criteria for HI

- Mission Management (CMM)
  - Mission CONOP
    - Common understanding of problem
    - More than INs
- J2EE/Web Service Standards
  - N Tier vs 2 Tier
  - Thin vs Thick Clients
  - M-M vs P-P
  - Open vs Stovepipe Architecture
  - Client/Server vs Services Based

Success Criteria for HI

- Common Data Standards
  - SIGINT Data Model
  - SIGINT Format
    - NSA Migration Plan
    - USSID/Reports
- IA Security
  - PL3 US Only
  - PL3+ Partners
  - Replication for SIPR

UCAO/DE Structure

USSG

- USN
- USMC
- USCG
- USA
- USAF
- CIA
- NRO
- DIA
- NSA

SEAB

- ESE
  all portfolio managers
- ITI
- CIO
- SIGINT
- IA
- CBS
- FAD
- JHU/APL

Director: Unified Cryptologic Architecture Office
and
Chief DE: Architecture and Systems Engineering (SE/A)

Forward Deployed

- SIGINT Chief SE/A
- IA Chief SE/A
- ITI Chief SE/A
- CBS Chief SE/A
- PEO Program Chief Engineers

- Link to Mission requirements generation
- Link to Missions
- Link to PEO Program SE
- Link to non-PEO program integration

5 Portfolios

Community Partner Representatives

- USN
- USMC
- USCG
- USA
- USAF
- CIA
- NRO
- DIA
- NSA

- Link to Partner Missions
- Link to Community Programs (e.g, DCGS)

Integration

- LSI Contract O/S
- Integration
- System Interface Management
- Standards Program
- IMS

- Link to PEO
- Link to major Programs

SE/A Analyses and Issues

- Program SE/A Analyses
- Special Focus Issues
- Implementation Analyses
- SE/A Investigations
- Simulation and Modeling
- Architecture Performance assessment

- Link to Mission threads
- Link to SAE
- Link to CEMO

Architecture

- Architecture Guidance
- Enterprise Architecture Development
- Interface Management
- Arch Contract O/S
- V&V

- Link to CIO
- Link to IT IS
- Link to NTIO
- Link to External Architectures
- Link to Community Programs (e.g., ICSIS)

Process

- SE Process/Policy
- SWE Process/Policy
- CM Process/Policy
- QA Process/Policy
- Process Improvement
- Test/Deployment Process/Policy
- Certification Programs
- PI Contract O/S

- Link to Prof Health
- Link to ADET
- Link to OTA

Planning & Financial Management

- CPPG
- Tech Forecast
- ECMRG Support
- USSG Support
- SE/A Strategic Planning
- EC Management
- Program Builds
- Legislative Affairs

- Link to Corporate Planning Processes
- Link to Finance
- Link to LAO

UCAO | DE
Unified Cryptologic Architecture Office
NSA/CSS Directorate of Engineering

NSA/CSS EA

- Enterprise wide in perspective
- Two levels
  - Above Program
  - Program
- Comprised of Four Business Segments
  - SIGINT
  - Information Assurance
  - Information Technology
  - Corporate Business
- Comprises “as is” through “to be”

Governance

- Integrated into NSA/CSS Policy
  - Strategic Management Process
  - System Engineering
- System Engineering and Architecture Board (SEAB)
- Enterprise Architecture Working Group (EAWG)
- Business Unit Architecture Working Groups
- Program Level Architectures
- Architecture Development and Management Plan (ADMP)


MICHAEL LOWE
TRUCK & CRANE HIRE


MICHAEL LONG
TRUCK & CRANE HIRE


MICHAEL LONG

Raytheon

What Do Others Call It?

Net-Centric Warfare – U.S.A.

Network-Centric Warfare – U.S.A.

Network-Centric Operations & Warfare – U.S.A.

Network-Centric Capability - NATO

Network-Enabled Capability – United Kingdom

Info-Centric Warfare - France

Networked-Based Defense - Sweden

Knowledge-Based Command & Control – Singapore

Net-Work Centric Operations – Netherlands

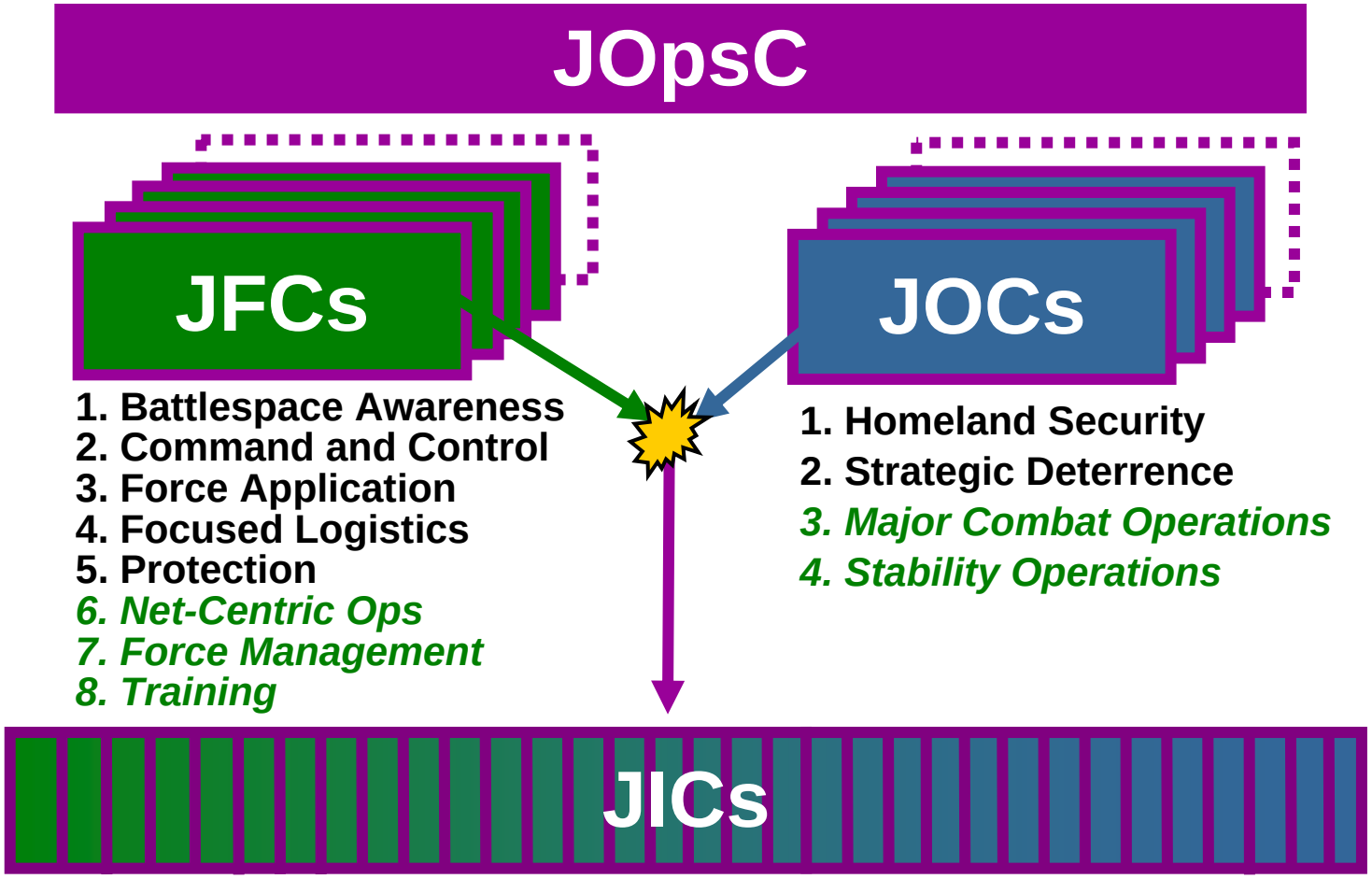
Network-Enabled Warfare - Australia

Connectivity

is What It is All About!

Current Joint Concepts*

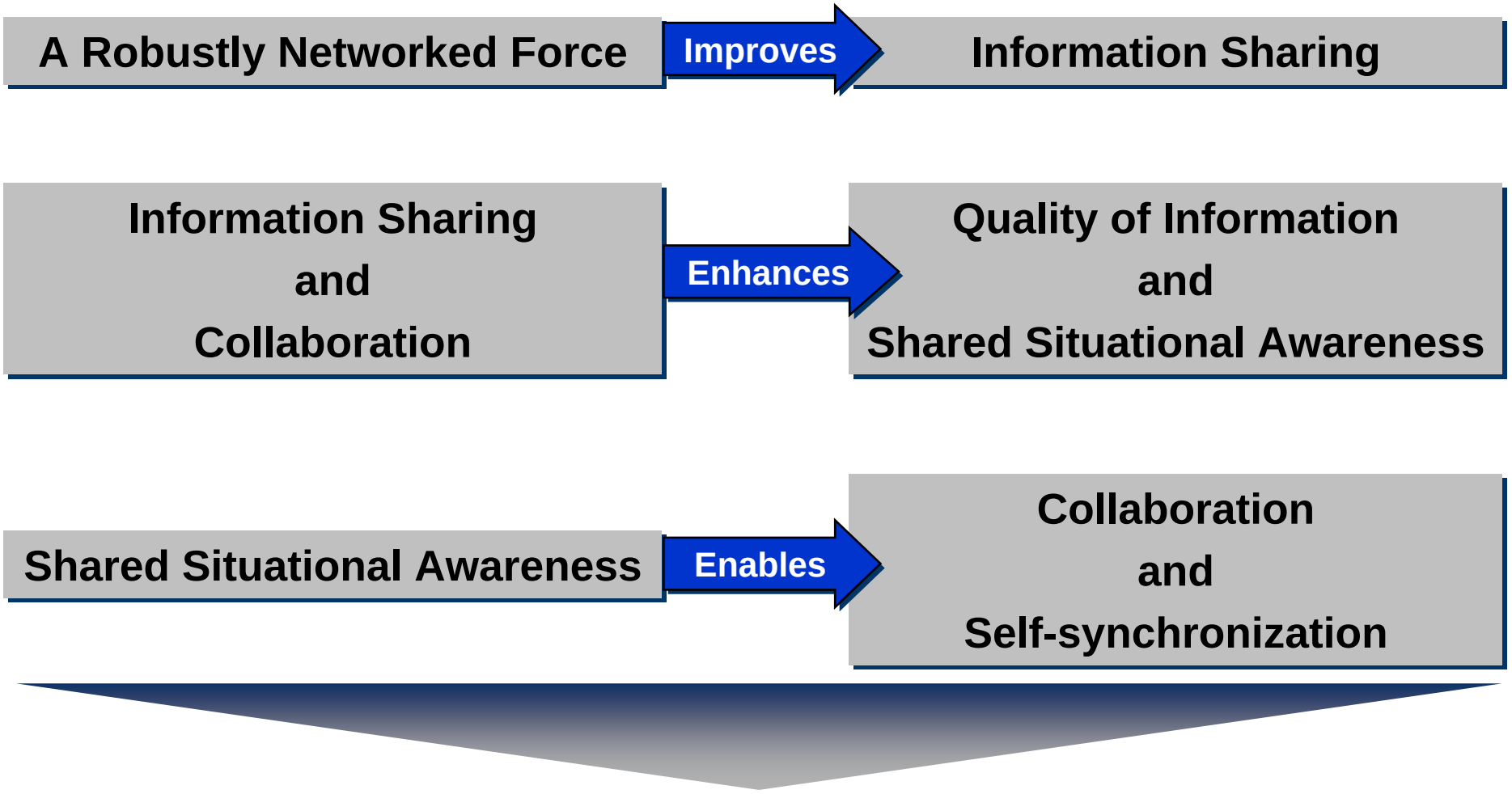
Raytheon



1. Forcible Entry Ops
2. Undersea Superiority
3. Global Strike Ops (USAF, FA FCB)
4. Sea-Basing Ops (Navy/Marines, FM FCB)
5. Air & Missile Defense (USAF, FP FCB)
6. JC2 (JFCOM, C2 FCB)
7. Joint Logistics (Army, FL FCB)

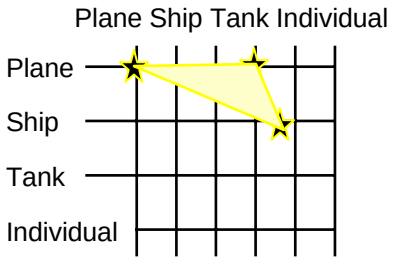
*Joint Staff J-7, CDR. Todd Kiefer, September, 2004

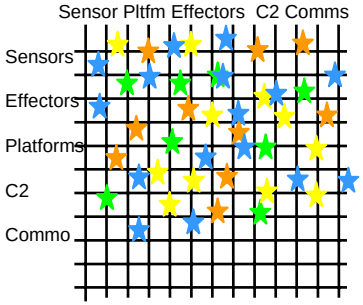
The Tenets of NCW



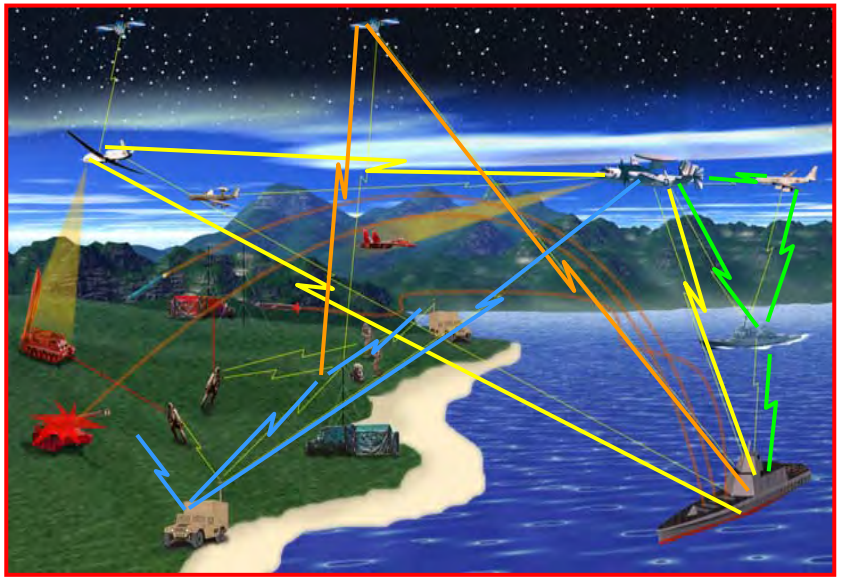
Creating Actionable Information

- **Complexity**
  - Expanding number of “netted” systems on an unprecedented scale
  - Multiple architectures
  - Scaling
  - Effects-based capabilities
  - Complex resource allocation





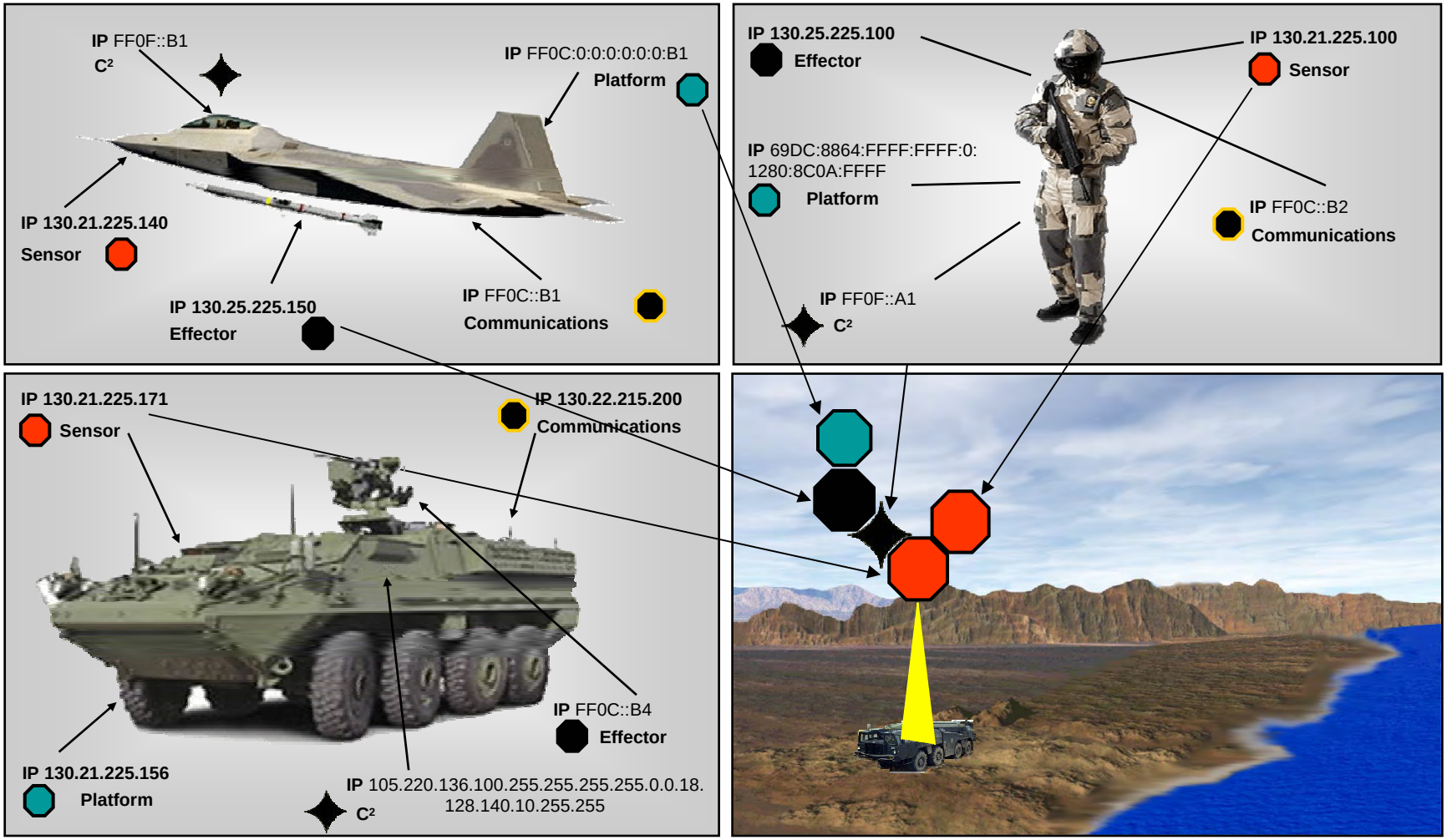
- **Compliance**
  - Joint capabilities processes
  - Systems engineering and requirements flow-down
  - Distributed development
  - Modeling & simulation
  - Testing complexity
  - Account for unexpected behavior



- **Acquisition challenges**
  - Co-evolution & convergence
  - Current system assimilation
  - Asynchronous programmatics
  - Budget pressure

Tying It All Together – Net Centric Operations

Raytheon



Internet analogy – every weapon, sensor & platform has an IP address

Some Take Aways

- NCW is more about networking than networks
- NCW is the military's adaptation to the Information Age
- NCW involves the redefinition of command and control
- A new vocabulary and a new set of criteria are needed

NORTHROP GRUMMAN

DEFINING THE FUTURE

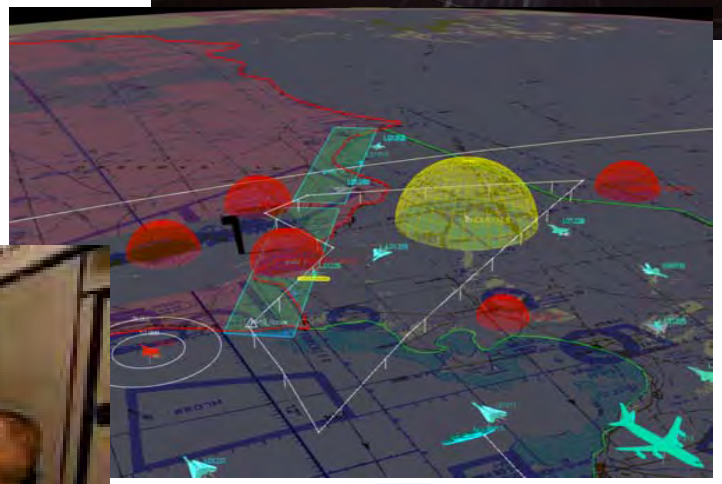
Joint C2 Interoperability & Network Centric Operations

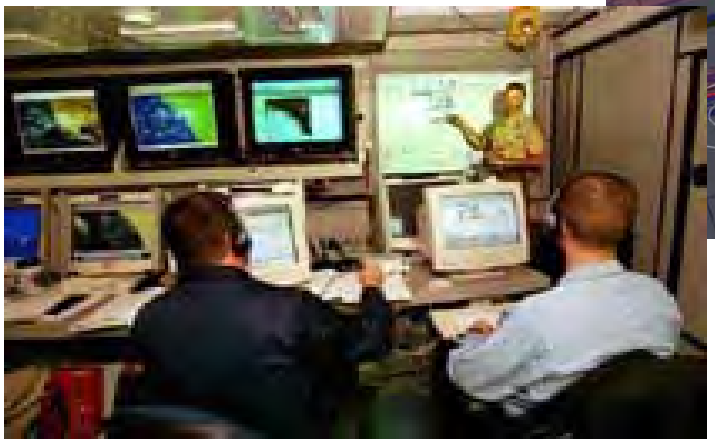
March 23, 2005

Gary W. Claunch
Deputy Director Strategic Planning
C3IS
Northrop Grumman Corporation
Defense Mission Systems Division

Agenda

- Network Centric Warfare
- Command and Control Transition
- Northrop Grumman Initiatives
- Summary

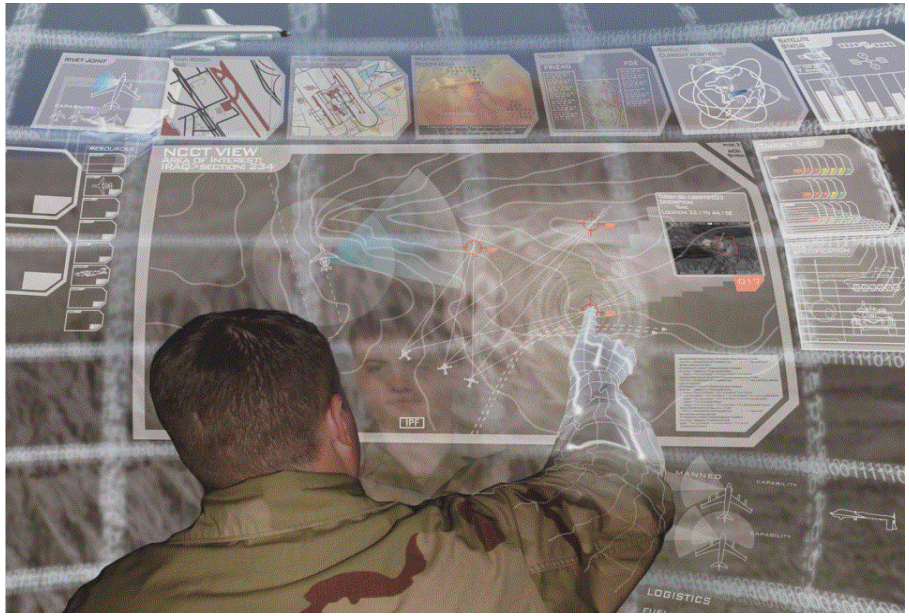




NORTHROP GRUMMAN

Net-Centric Warfare

"An Information Superiority-Enabled Concept of Operations That Generates Increased Combat Power by Networking Sensors, Decision Makers, and Shooters to Achieve Shared Awareness. Increased Speed of Command, Higher Tempo of Operations, Greater Lethality, Increased Survivability and a Degree of Self-synchronization."

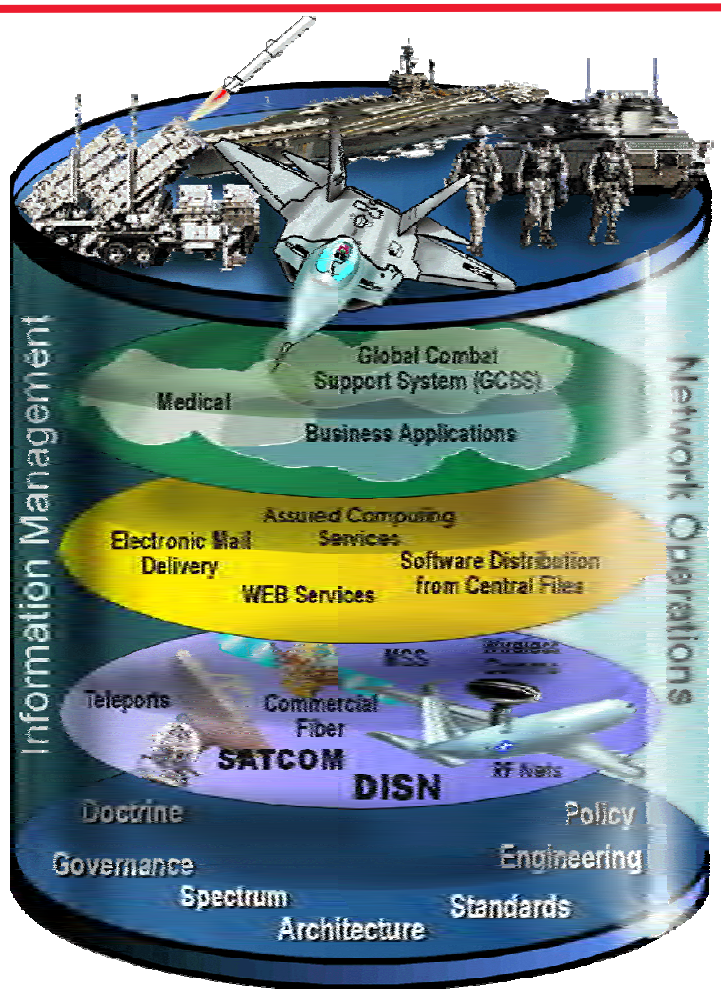


Network Centric Warfare
Developing and Leveraging
Information Superiority
2nd Edition

NORTHROP GRUMMAN

Fundamental Changes Are Required

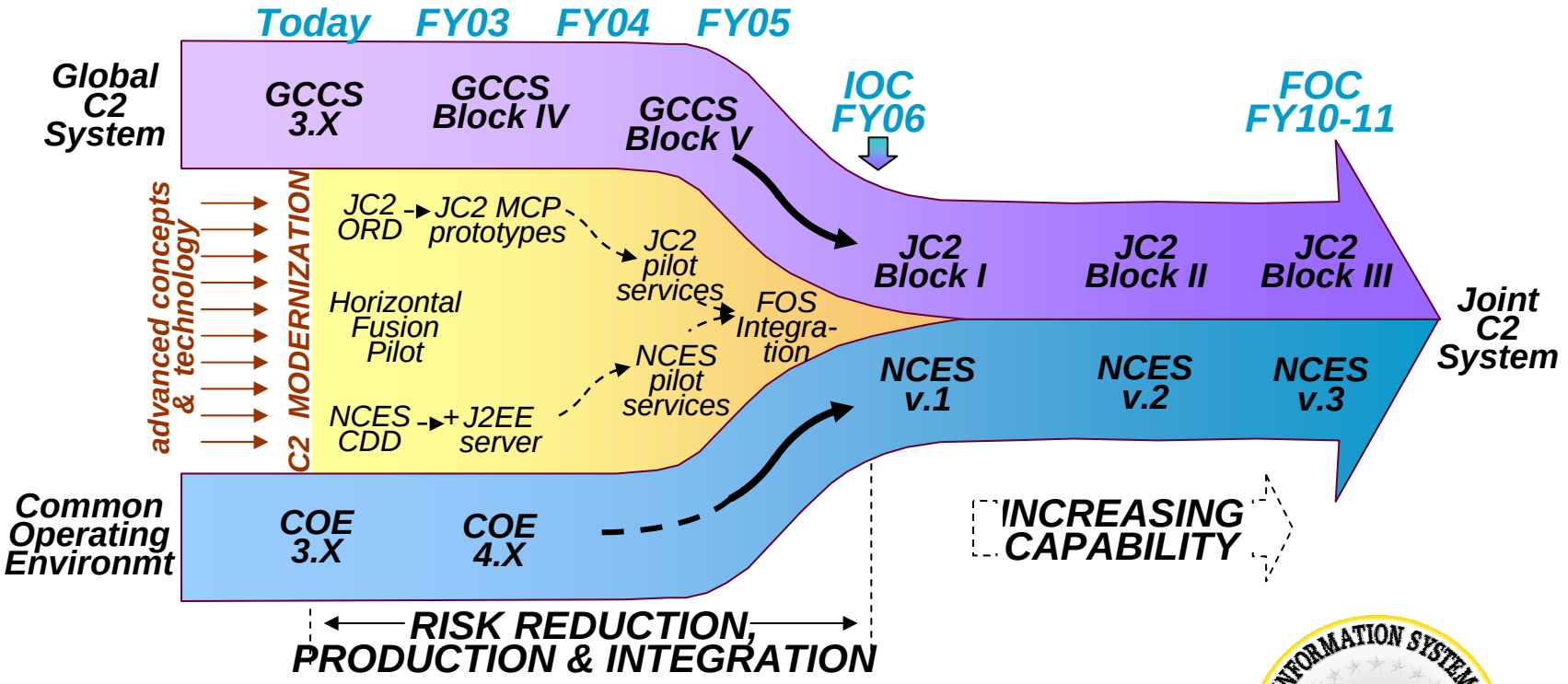
- **Acquisition**
  - Spiral Development
  - Rapid Fielding
  - Leveraged Investments
- **Operational**
  - Increased Automation
  - Comprehensive Mission Planning
  - Speed of Decision
- **Technologies**
  - Service Oriented Architectures
  - Improved Processing
  - Adaptive Communications
  - Unparalleled Connectivity
- **Cultural**
  - Adaptation to Changes



C2's First Step To Net-Centricity is JC2 / NCES

NORTHROP GRUMMAN

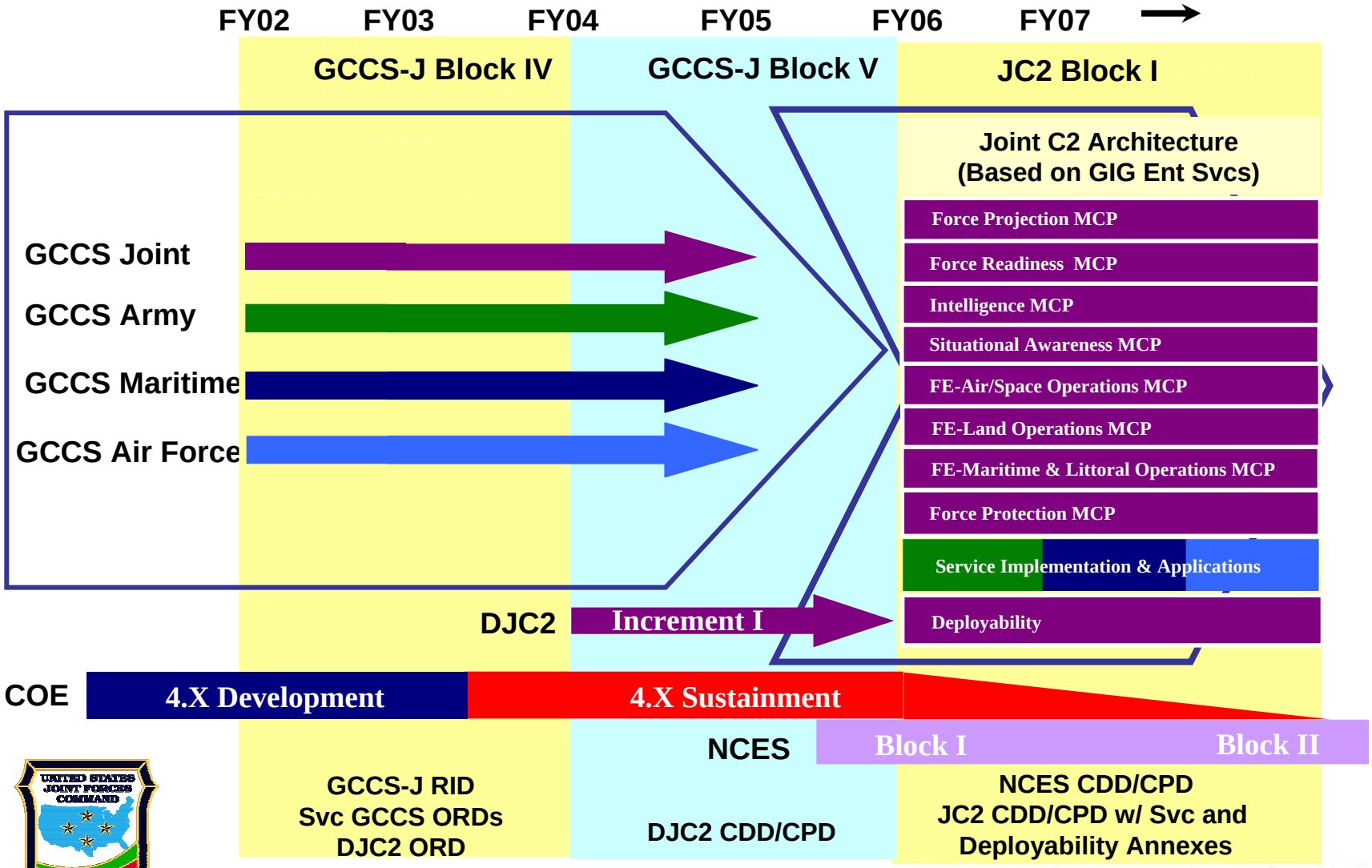
DISA's Transformation to JC2



- *Prototype the functionality of Mission Capability Packages*
- *Work out interfaces between MCPs*
- *Work out interfaces with NCES core services*
- *Develop C2&I-specific net-centric services*
- *Pilot MCPs with GCCS Block V in operational context*
- *Integrate final versions with production NCES v.1*

NORTHROP GRUMMAN

JFCOM's Transformation to JC2



NORTHROP GRUMMAN

The JC2 / NCES Net Centric

Global Information Grid (GIG)

C2 and I Specific Network Centric Enterprise Services

C2
message parsing
Data Fusion
COP distribution
Decision Support
Etc.

API

Force Employment Air/Space Operations

Situational Awareness

Force Projection

Force Readiness

JC2 Mission Capability Packages

Intelligence

Force Employment Maritime & Littoral

Force Protection

Force Employment Land Operations

API

Shared Data Sources

- Force-level Planning
- Force Readiness
- SA Tracks
- Force Protection
- Joint IPB
- Targeting
- ISR Management
- Geo-Spacial

Application Programming Interface (API)

API

API

ESM | Discovery | Messaging | Collaboration | Mediation | Storage | IA/Security | Application | User Assistant

Network Centric Enterprise Services (NCES)

NORTHROP GRUMMAN

Adherence to Standards is Fundamental

- Net-Ready Key Performance Parameter Requires Compliance With:
  - Net-Centric Operations and Warfare (NCOW) Reference Model
    - Net-Centric Data Strategy
    - Net-Centric Checklist
  - Applicable Global Information Grid (GIG) Key Interface Profiles (KIP)
  - DoD Information Assurance Requirements
  - Supporting Integrated Architecture Products
  - Joint Technical Architecture

NORTHROP GRUMMAN

Government Standards Are Being Identified

Describes the **Activities Required to Establish, Use, Operate, and Manage the Net-centric Enterprise Information Environment** to Include: the Generic User-Interface, the Intelligent-assistant Capabilities, the Net-centric Service Capabilities (Core Services, Community of Interest (COI) Services, and Environment Control Services), and the Enterprise Management Components. It Also Describes a Selected Set of Key Standards That Will Be Needed As the NCOW Capabilities of the GIG Are Realized.

NORTHROP GRUMMAN

Spiral Development is the Approach

"A Desired Capability Is Identified, but the End-state Requirements Are Not Known at Program Initiation. Requirements Are Refined Through Demonstration, Risk-management, and Continuous User Feedback. Each Increment Provides the Best Possible Capability, but Requirements for Future Increments Depend on User Feedback and Technology Maturation." (DoD 5000.1)

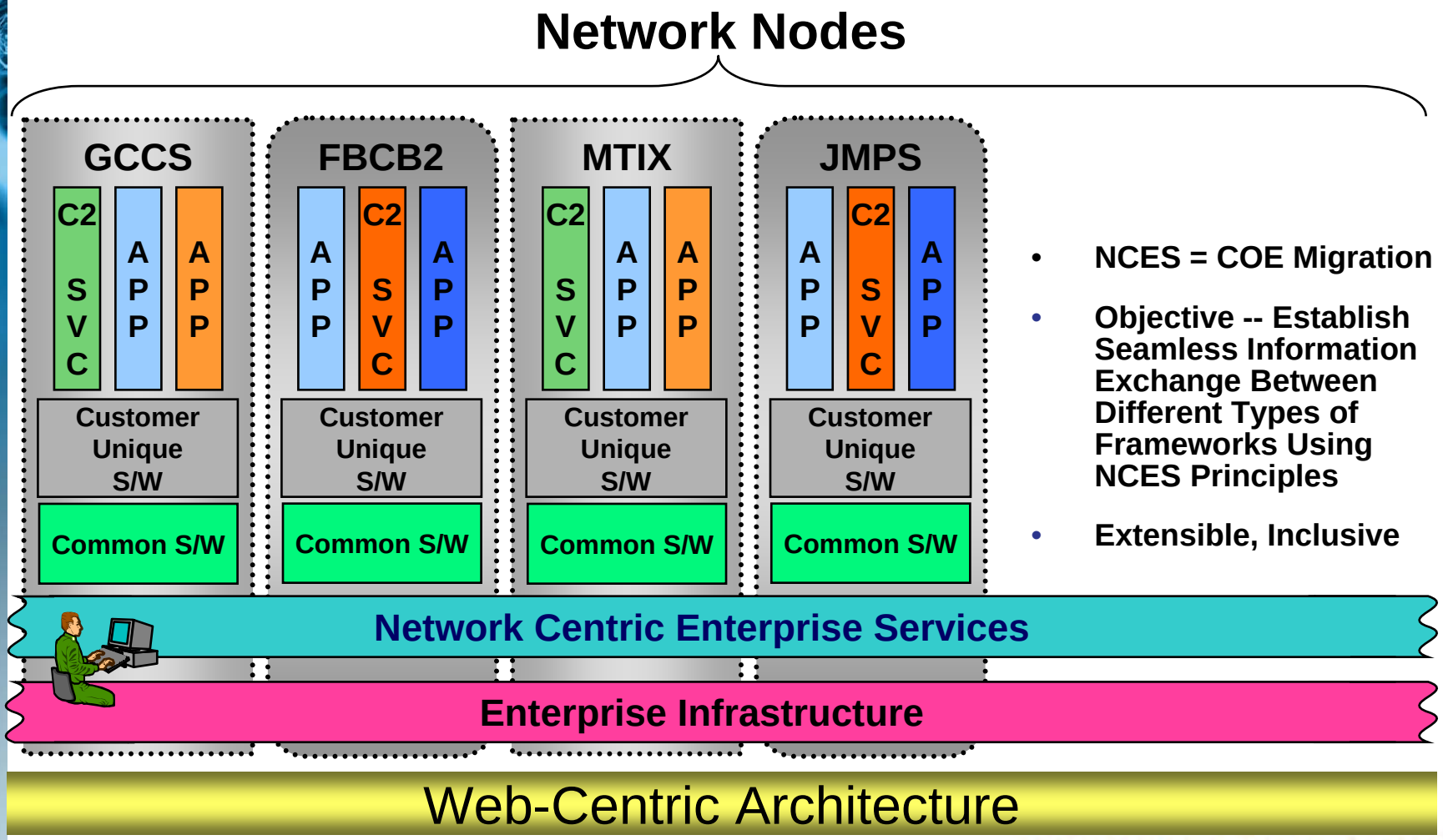
Rapid Delivery of an N% Solution Provides Adaptability to changes in Requirements and Technologies on an Affordable Basis

NCC Pilot is the Spiral Development Engine for C2

NORTHROP GRUMMAN

NGC Frameworks Initiative – Closing the Seams

Addressing the Issues of a Service Oriented Architecture

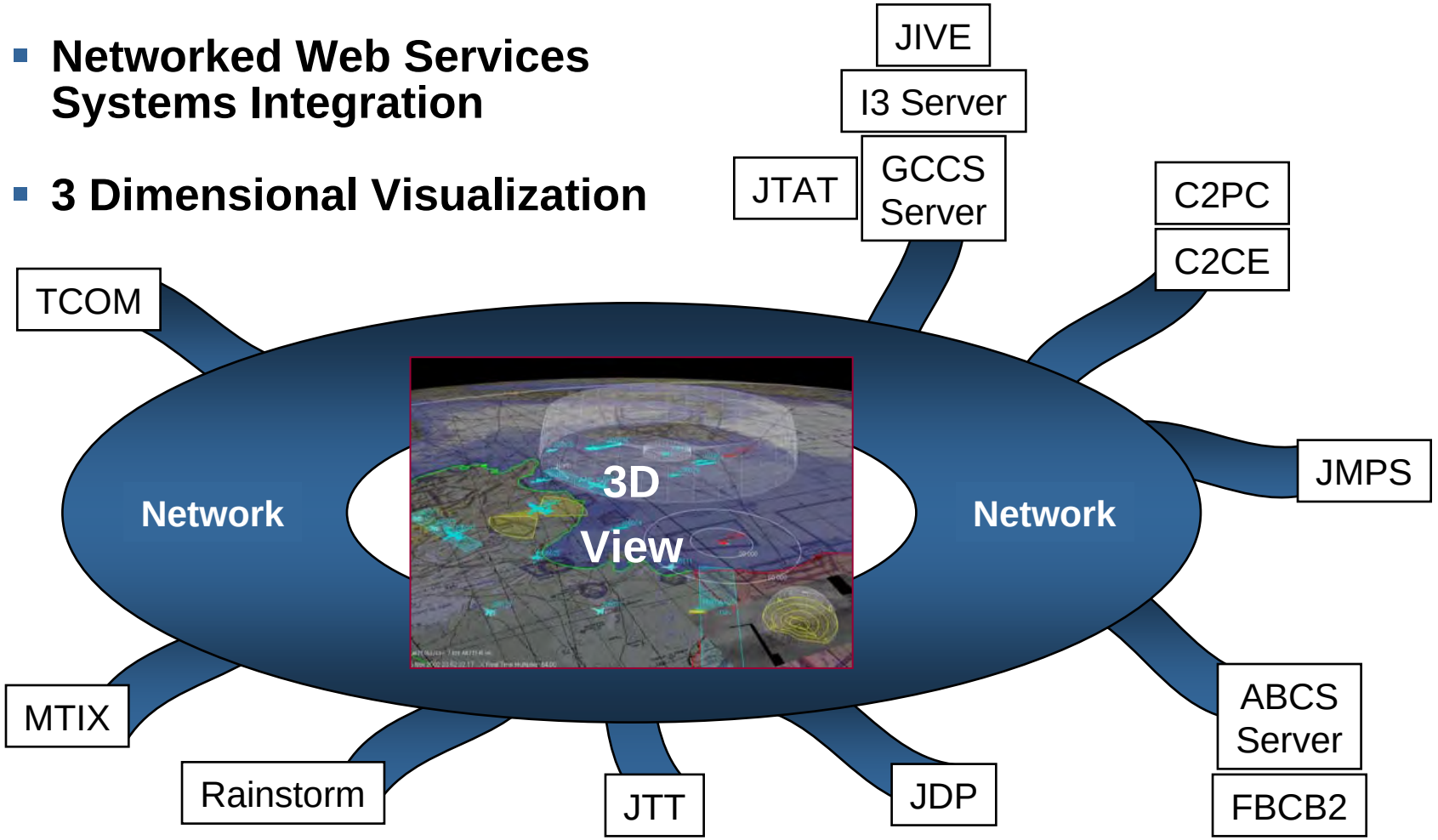


- NCES = COE Migration
- Objective -- Establish Seamless Information Exchange Between Different Types of Frameworks Using NCES Principles
- Extensible, Inclusive

NORTHROP GRUMMAN

Current C2 Frameworks Configuration

- **Networked Web Services Systems Integration**
- **3 Dimensional Visualization**



Seamless Data Exchange Independent of Platform or Operating System

NORTHROP GRUMMAN

Service Oriented Architectures

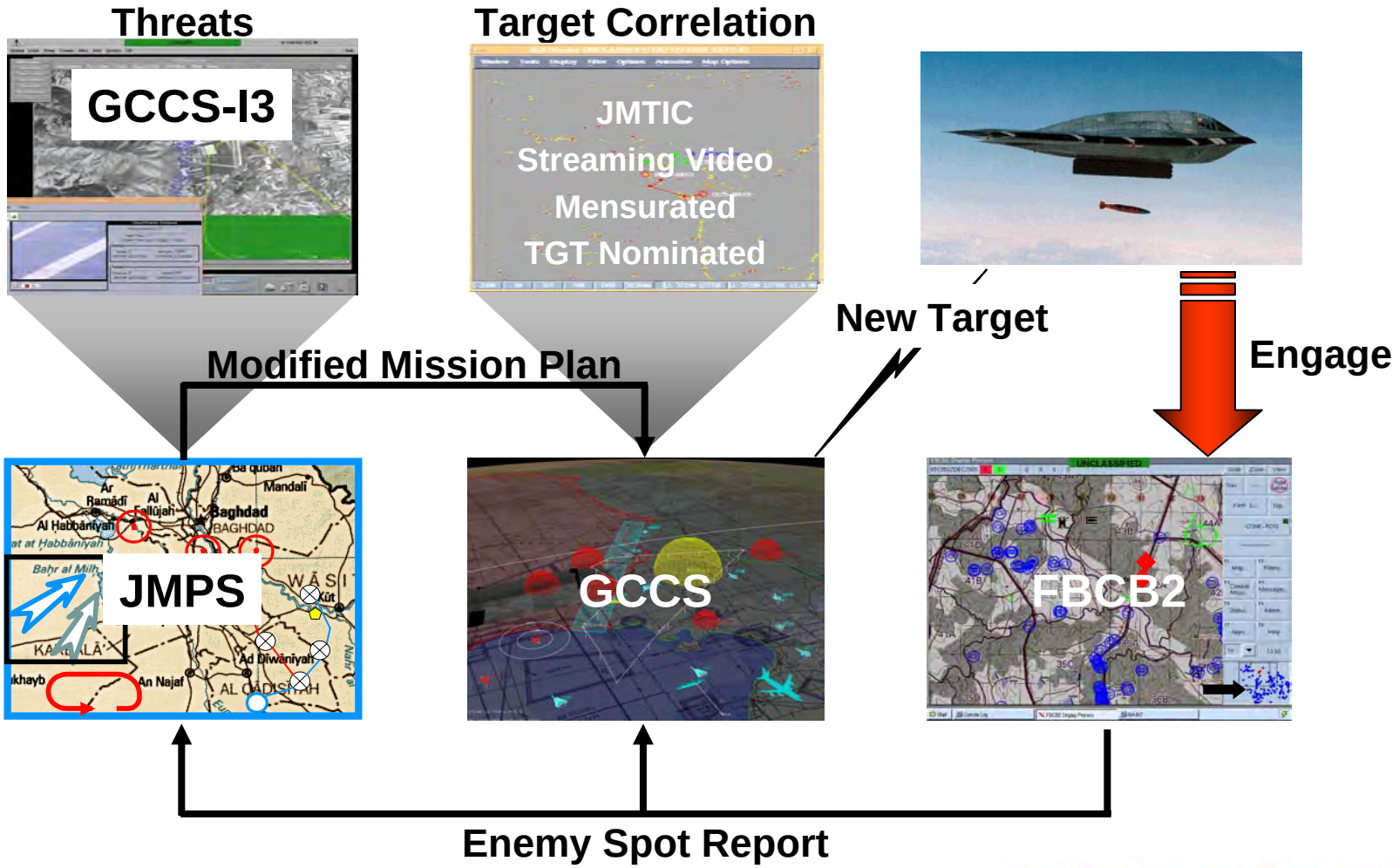
- **Enables Machine to Machine Interfaces**
- **Provides Rapid Addition of Capabilities**
  - **GCCS-M to AIS Interface Delivered in 30 Days**
    - **Very affordable**
  - **Exercised in Trident Warrior 04**
  - **Participating in Trident Warrior 05**
- **Leverages Current Investments**
  - **Provides Fielded Systems Another Level of Interoperability**

Rapid, Affordable Addition of Capability for Fielded Systems

NORTHROP GRUMMAN

Product is "Integration at the Next Higher Level"

Dynamic Re-Planning



New Capability That Individual Systems do not Have

NORTHROP GRUMMAN

Summary

- **Movement is in the Right Direction**
  - **Continue Definition of Standards**
  - **Spiral Development is the Correct Path**
    - **Incremental improvements**
  - **Continue to Improve Acquisition approach**
- **Technology is Ready**
  - **Service Oriented Architectures Can Leverage Current Investments**
  - **Machine to Machine Interfaces to Rapidly Add Capabilities are Attainable**

NORTHROP GRUMMAN


Innovative Possibilities
L01258
L01216
L01248
UNDERDOG 9
L01238
L01209
L01226
L01230
L01225
L01237
L01211
L01227
North

Joint Test & Evaluation Program

Program Overview

Mr. Mike Crisp
Deputy Director
Air Warfare
DOT&E

Mr. Jim Thompson
Joint Test and Evaluation
Program Manager

March 22, 2005

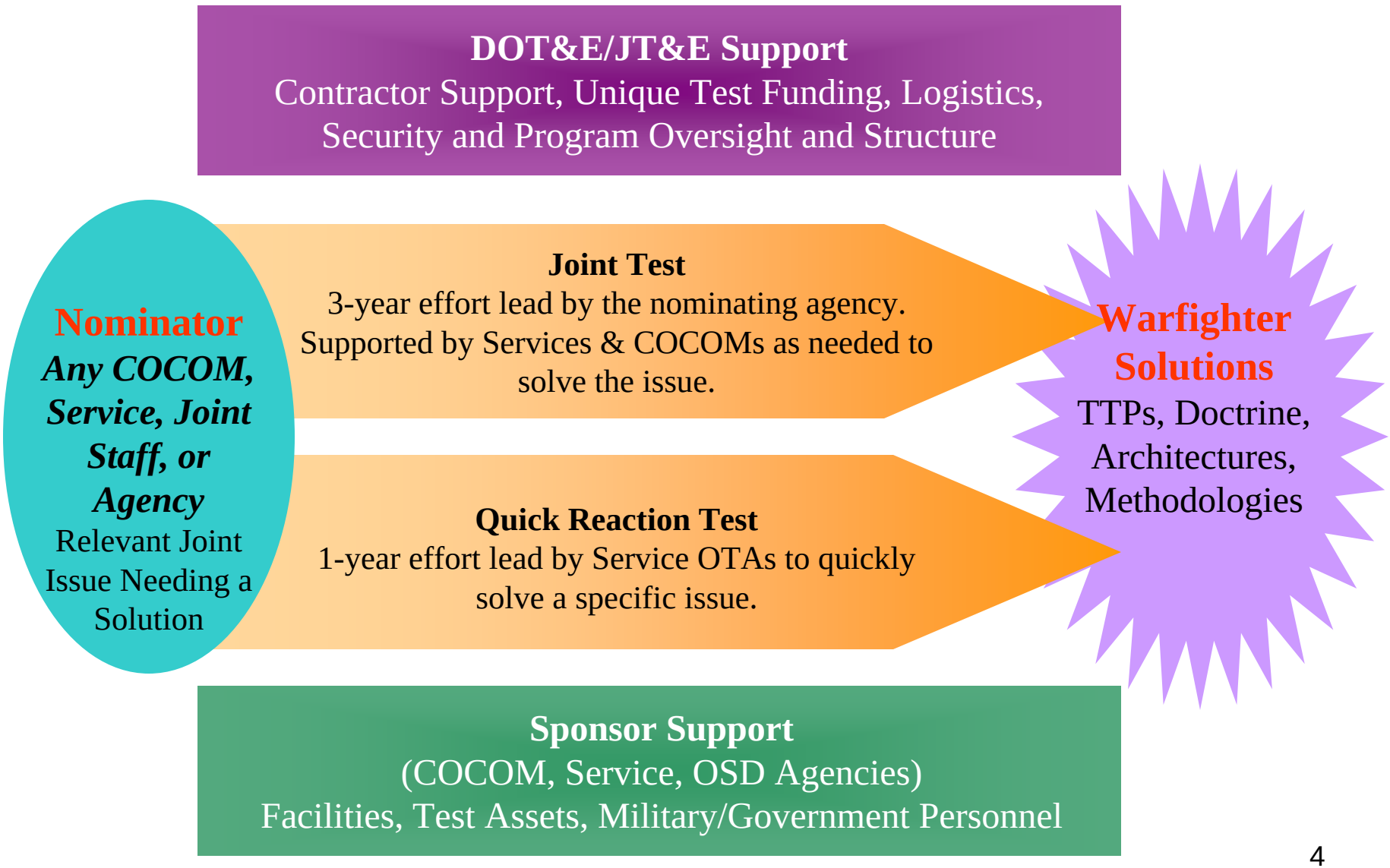
What is the JT&E Program?

- **DOT&E program to assist the warfighter in solving operational issues through the development of tactics, techniques, and procedures; changes to operational processes; and C4ISR architectures**
- **Issues are resolved using operational test and evaluation techniques; not experiments, not demonstrations**
- **Joint operational solutions are the principal products of JT&E projects – not hardware acquisition products**

How Does the Program Work?

- **Nominating organization proposes JT&E project to resolve operational issue**
- **Selected nominations are chartered and funded by DOT&E but led by the nominating Service or COCOM**
- **Joint Test team resolves the operational issue by finding a process solution**
- **Services and COCOMs team with JT&E Program to provide military personnel, test assets, and test venues and facilities**
- **Test products are new joint tactics, techniques, and procedures; architectures; and processes**

Joint Test & Evaluation Methodology



Joint Test and Evaluation Purpose

- **Find ways for the warfighters to do their jobs better with today's equipment, organization, and doctrine**
- **Provide better tools and ways to test**
  - **Improve testing methodologies that have multi-Service applications**
  - **Improve modeling and simulation validity with field exercise data**
- **Provide feedback to the acquisition and joint operations communities**

Annual Budget – Approximately $40M

Two Avenues to Conduct Joint Testing

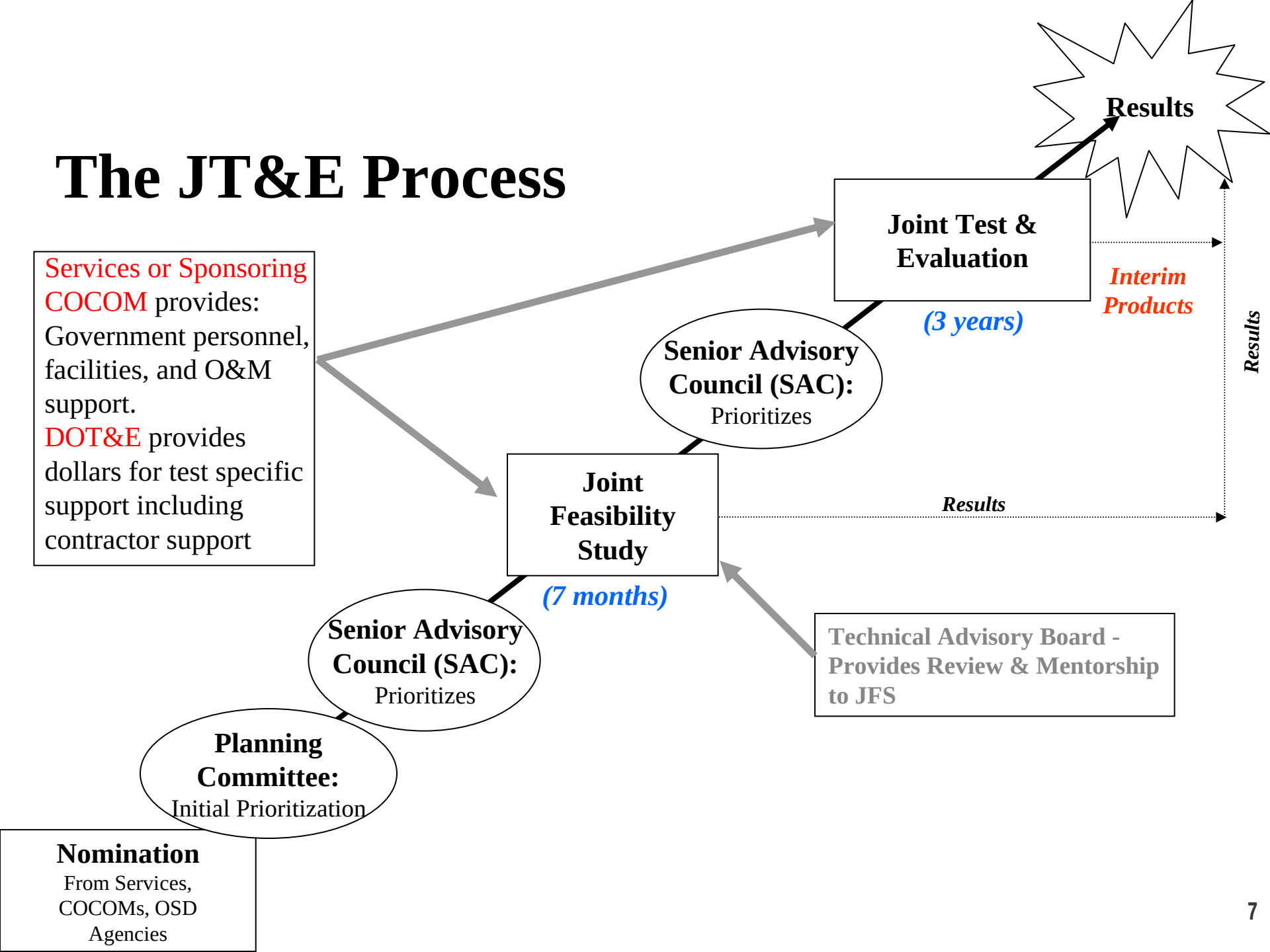
Quick Reaction Tests

- **Quickly addresses specific and focused warfighter issue within scope of JT&E program purpose**
- **Accelerated review, approval, execution**
- **Duration: 6-12 months (Nomination-to-Final Report)**
- **Sponsors: COCOMs, JFCOM, Services, OSD**
- **Executed by Service OTAs**
- **Product provides specific answer to a specific question**
- **Resourcing for OTA participation in accordance with JT&E guidelines**

Streamlined JT&E Projects

- **In-depth, methodical evaluation of issues within scope of JT&E program purpose**
- **Duration: 3 years maximum (Charter-to-Closedown)**
- **Sponsors: COCOMs, JFCOM, Services, OSD**
- **Executed by Service-led JT&E test teams**
- **Delivers defined and useful products to warfighter**
  - *Both interim and final products required*

The JT&E Process



Joint Test and Evaluation Program

Current Feasibility Studies, Tests and QRTs

New Joint Feasibility Study

- **Joint Test and Evaluation Methodology (JTEM) Joint Feasibility Study –** JTEM will validate a methodology defining and using distributed live, virtual, constructive test environment to evaluate system performance and joint mission effectiveness to include defining processes necessary to institutionalize testing in a joint environment.
  - **During FY06, JTEM will complete a joint feasibility study that will determine necessity and feasibility for conducting the proposed JT&E project.**
  - **Proposed Test Products: Capability to efficiently develop live, virtual, and constructive simulation-based test environments, based on joint mission areas and the joint tactical tasks, that enable the testing of new weapon systems in a robust, realistic, joint operational environment.**

Joint T&E Projects and Quick Reaction Tests

- Joint Integration And Interoperability Of Special Operations (JIISO) **- Tests and improves the integration and interoperability of Special Operations and Conventional Forces mission planning and execution capabilities in support of Joint missions.**
- Joint Methodology to Assess C4ISR Architecture (JMACA) **- Has developed and is validating a methodology to assess C4ISR architectures as they relate to mission outcome.**
- Joint Data Link Information (JDICE) **- Develops JTTPs to improve Link 16 information exchange capabilities and integrate ISR, C2, and shooter assets at the tactical employment level.**
- Joint Space Control Operations (Negation) (JSCO-N) **- Develops necessary C2 process and JTTPs to integrate and synchronize friendly space control negation capabilities (lethal and non-lethal) into the Joint Force Commander's targeting cycle.**
- Joint Logistics Planning Enhancement (JLOG)**- Investigates the overarching logistics command and control (C2) Architecture, the information and process interfaces and enhancements possible to support requirements for joint force logistics and operations.**
- Joint Fires Coordination Measures (JFCM) **Tests and evaluates new JTTP designed to standardize kill box procedures and enable theater commanders to more fully integrate component fires at the operational and tactical levels.**

Joint T&E Projects and Quick Reaction Tests

- Joint Survivability (JSURV) Quick Reaction Test (QRT) **- Developed and delivered convoy survivability procedures to USCENTCOM to minimize combat casualties. Approximately 90% of deployed convoys are using these procedures.**

- Joint Shipboard Weapons and Ordnance (JSWORD) (QRT) **- Establishes, documents, and publishes a standard joint procedure for tube loading the 2.75-inch Folding Fin Aerial Rocket (2.75" FFAR) on U.S. Army (USA) and USSOCOM helicopters with engines running and blades turning.**

- Joint Low Altitude Aircraft Survivability (JLAAS) (QRT) **- Investigates fixed and rotary wing aircraft operations in the low-altitude, low-speed environments for vulnerabilities to numerous potential threats including Man-Portable Air Defense Systems (MANPADS), rocket-propelled grenades (RPG), and small arms fire.**

- Joint Forward Operations Base Force Protection (JFOB) (QRT) **– Will examine current tactics, techniques, and procedures that the Services employ for FOB force protection and provide recommendations and solutions to develop a standard of protective measures to be implemented by the Services.**

Joint Test & Evaluation Bottom Line

- **A quarter century legacy of <u>supporting the warfighters</u>**
- **On the leading edge of developing new tactics, techniques, procedures, & capabilities**
- **Making inventory military systems more effective and capable**
- **The JT&E Program is managed by DOT&E, but it requires active participation and support of the Services, OSD Agencies, Joint Staff, JFCOM, and other COCOMS**

www.jte.osd.mil

Joint Integration and Interoperability of Special Operations (JIISO)

Joint Test and Evaluation (JT&E)

NDIA – Net Centric Operations, Interoperability & Systems Integration Conference

22 March 2005

Mike Dorris, GS-15
Director, JIISO JT&E
dorrism@socom.mil
813-828-6520

Agenda

- Purpose
- Charter
- General Officer Steering Committee & Mentors
- Mission
- Scope
- JIISO's Role In a Net Centric Operational Environment Joint Integrating Concept
- "As-Is" Command & Control Interoperability
- Test Concept
- JIISO Products/Focus Areas

Purpose

To provide information concerning the JIISO JT&E and JIISO's contributions to Net Centric Interoperability.

JIISO JT&E Chartered by OSD

- Authority: Signed effective 11 Feb 04 by Dep Dir, Air Warfare, DOT&E
- Mission: Three year charter (Feb 04 – Mar 07) to …
  - **Improve the operational effectiveness** of **joint integration and interoperability** (I&I) of **Special Operations Forces (SOF) and Conventional Forces (CF)**
  - Test and evaluate the I&I of SOF and CF during **planning and execution of maneuver and fire support coordination** during tactical operations
  - Focus is to **evaluate JTTP and supporting system of systems (SoS)**
  - **Develop test products** to support joint operational, training, and acquisition communities and **make recommendations to improve** doctrine, organization, training and education, materiel, leadership, personnel and facilities (**DOTMLPF**)
- Participants
  - USSOCOM is the lead Service/executive agent for JIISO
  - USJFCOM and USMC are co-sponsors
  - Services and Unified Commands are participants
- Reporting channel
  - Joint Test Director reports to Dep Dir, Air Warfare, DOT&E via JT&E PM

General Officer Steering Committee (GOSC)

Name	Position
LTG Wagner (Co-Chair)	DCDR United States Joint Forces Command (USJFCOM)
VADM Olson (Co-Chair)	DCDR United States Special Operations Command (USSOCOM)
To Be Determined	ASD Special Operations and Low Intensity Conflict
MG Parker	CG JFK Special Warfare Center and School
RADM Zelibor	Director of Global Operations, United States Strategic Command
Maj Gen Peterson	Director Operations & Training, DCS Air & Space Operations, Air Staff
Mr. Crisp	Deputy Director Air Warfare, DOT&E, OSD
BG Risher	Director Center for Knowledge & Futures, USSOCOM and President, Joint Special Operations University
BGen Neller	Director Operations; Plans, Policies & Operations; HQ USMC
Brig Gen Burda	Director of Operations, Air Force Special Operations Command
BG Freakley	Commander, Army Infantry Center
RDML Mahon	Director *Deep Blue*, CNO Staff

JIISO Mentors

Name	Position
William Tangney (LTG [Ret])	Senior Mentor
Stephen Moore (SES-4)	Dir Joint Training, Analysis and Simulation Center, USJFCOM
Steven Derganc (SES-2)	Dir Joint Interoperability and Integration (JI&I), USJFCOM J8
Jack Zavin (GS-15)	Chief Information Interoperability, Architecture and Interoperability, OASD for Networks and Information Integration
Dr. Bob Bell (GS-15)	Scientific Advisor, Marine Corps Operational Test and Evaluation Activity

Mission Statement

To improve and streamline the Joint Force Commander's integration and interoperability of Special Operations Forces (SOF) and Conventional Forces (CF) during planning and execution of maneuver and fire support coordination to generate more timely actions and increased opportunities with less potential for fratricide.

Scope

- **Operational Scenario**
  - Combat operations primarily associated with a “less than fully mature battlespace, less than major conflict.”
  - Contiguous and non-contiguous battlespace
  - Distributed forces
- **Organizations: JTF and below (SOF and CF)**
  - Fire support coordination and liaison elements
  - Current and future operations groups
  - Joint fires assets

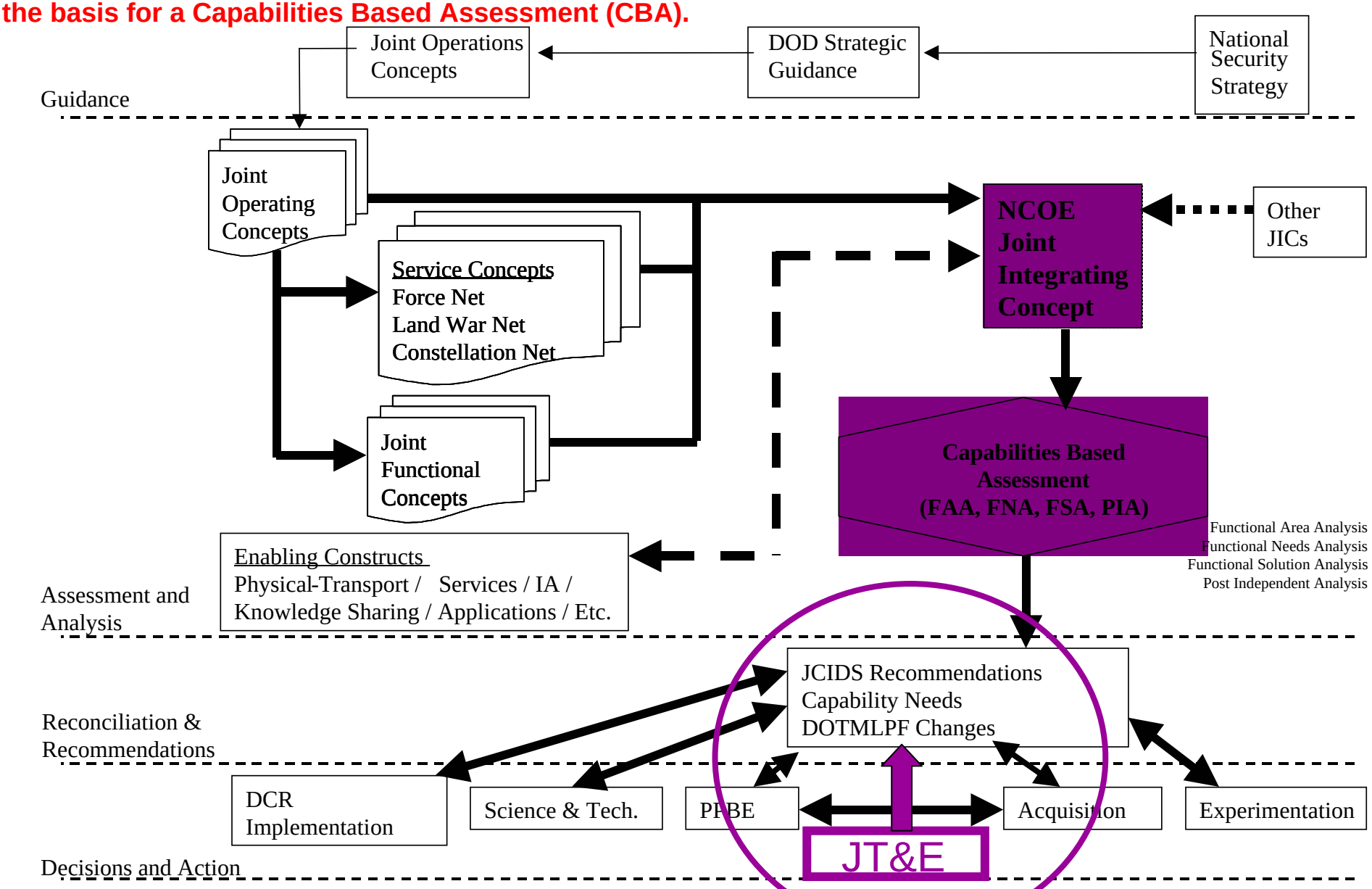
Emphasis on TTP

- **Maneuver Issues**
  - Integration of planning and execution
  - Assignment/assumption of battlespace
  - C2, maneuver and airspace control measures
- **Fire Support Coordination Issues**
  - C2 of lethal fires and fire support coordination measures
  - Fratricide avoidance

Adapted from the Net Centric Operational Environment (NCOE) Project Brief 1-12-05

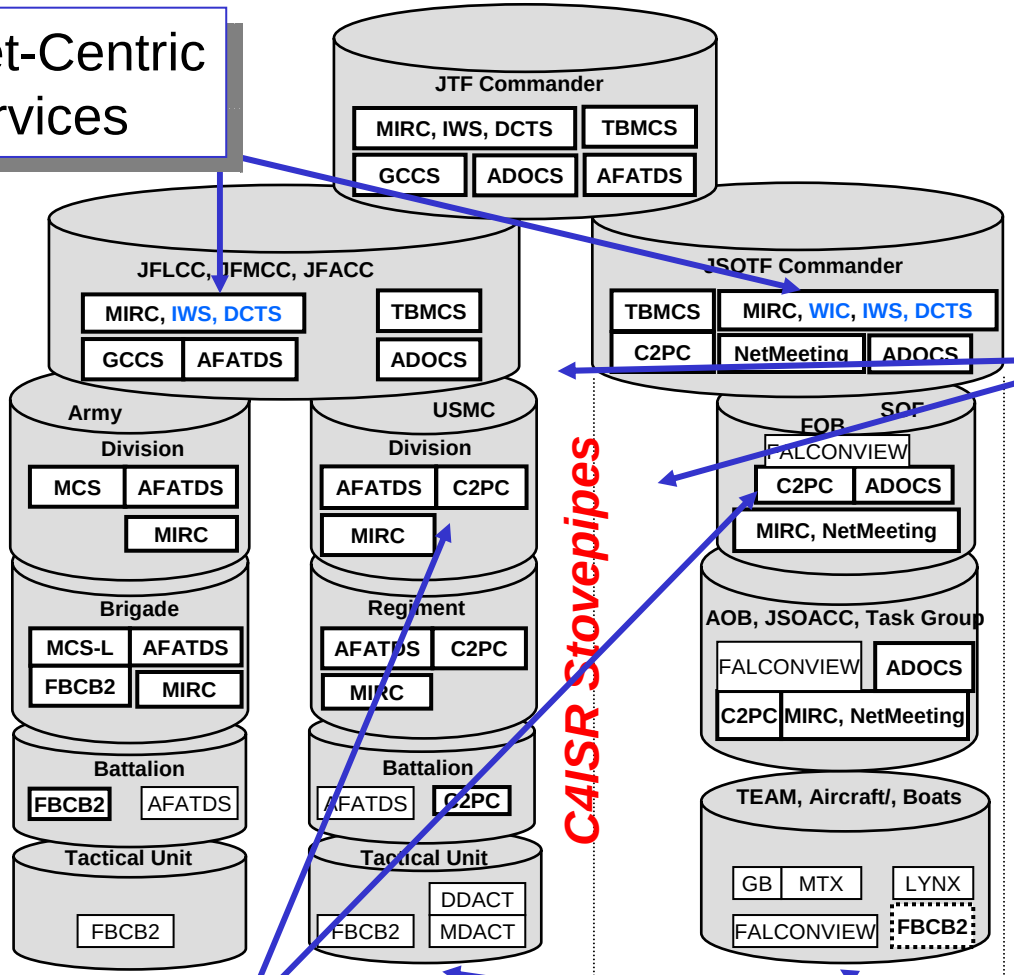
JIISO JT&E

Purpose: Develop a NCOE Joint Integrating Concept (JIC) with illustrative CONOPS to be the basis for a Capabilities Based Assessment (CBA).



"As-Is" SOF/CF C2 Interoperability

imited use of Net-Centric Enterprise Services



Manual Interface Through "LNOs"

Lack of Client Server Interoperability

Inconsistent Stovepipe Situational Awareness

Test Concept

- Three field tests (FT) prior to JIISO closeout in March 07
- Leverage scheduled exercises as test venues
  - Most affordable and least disruptive to training and deployment cycles
  - Venues:
    - Primary - FTX
    - Secondary - CPX
  - First FT is planned for Joint Readiness Training Center (in May 05)
  - Joint National Training Capability (JNTC) exercises are also good opportunities for testing based on force participation, and inclusion of JT&E exercise objectives
  - OCONUS Chairman's exercises outside USCENTCOM theater least impacted by current deployment tempo

Products Development Process

Gather Information

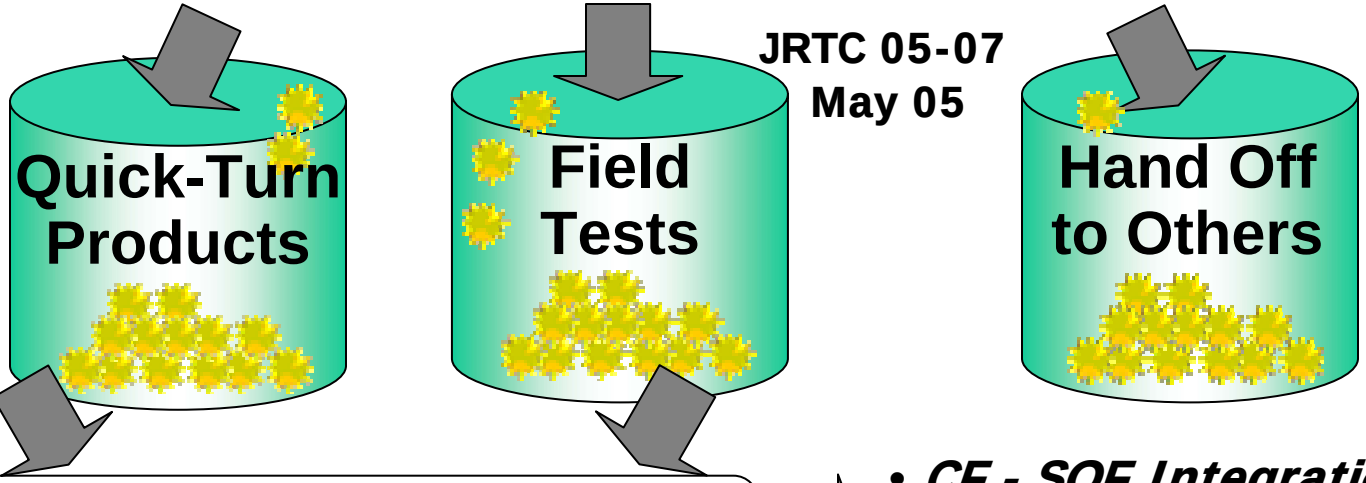
Analyze Information

Decide

AD HOC TTP & SOP ***proven during operations*** that do not require further testing

SOF/CF rubs that can be fixed, but enhancements ***require field testing***

Outside JIISO Scope/Capability



Resultant Products

Guidelines, TTP Handbooks; Other Doctrine, Organization Training and Materiel Recommendations, and Graphic Training Aids

- ***CF - SOF Integration & Interoperability Handbook***
- ***SOF - CF Tactical Situation***

CF - SOF Integration and Interoperability Handbook

- Vetted with SOF and CF communities
- To be introduced in April 05 to units participating in FT1

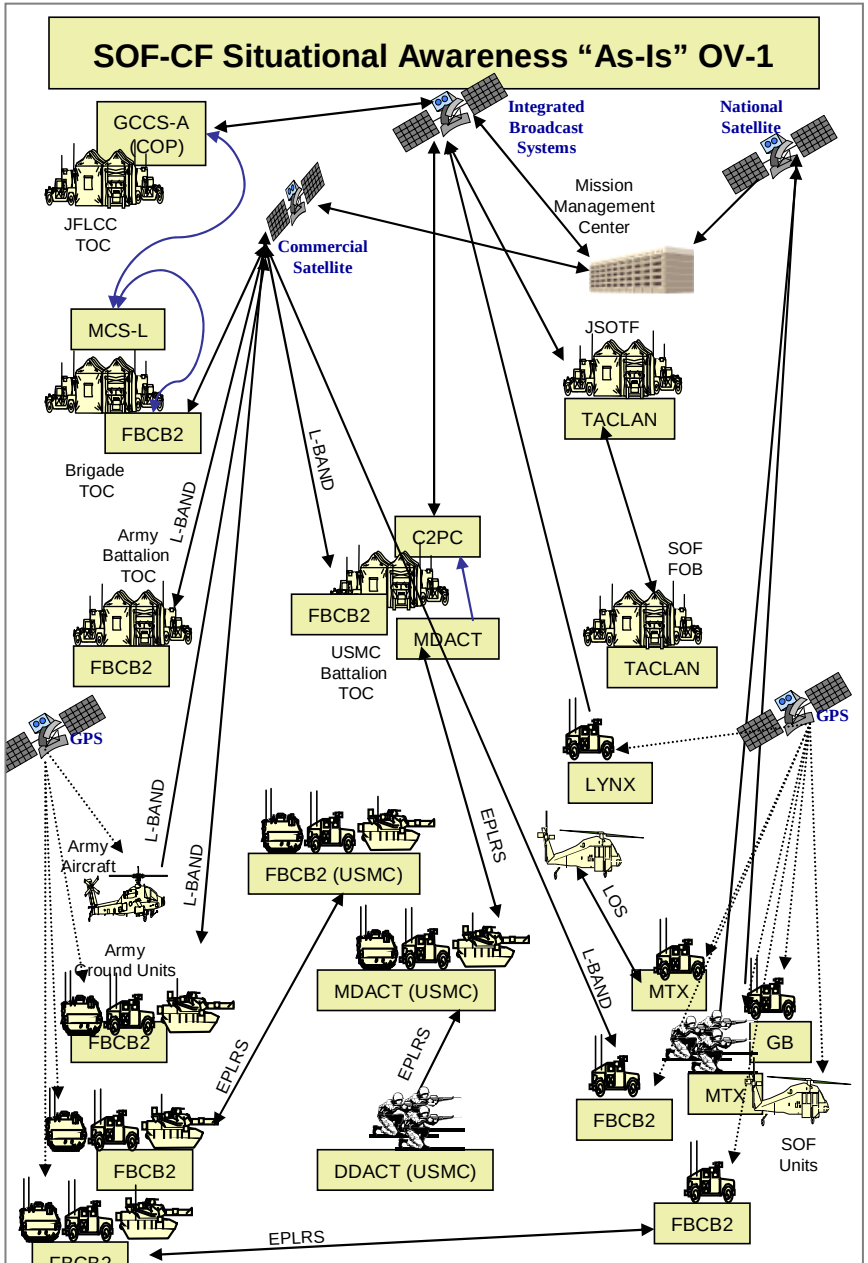
Handbook Chapters

Integration and Interoperability
Command and Control
Liaison and Control Elements

- Characteristics and Capabilities/ Limitations
- Planning Integrated Operations
- Joint Fire Support
- Intelligence

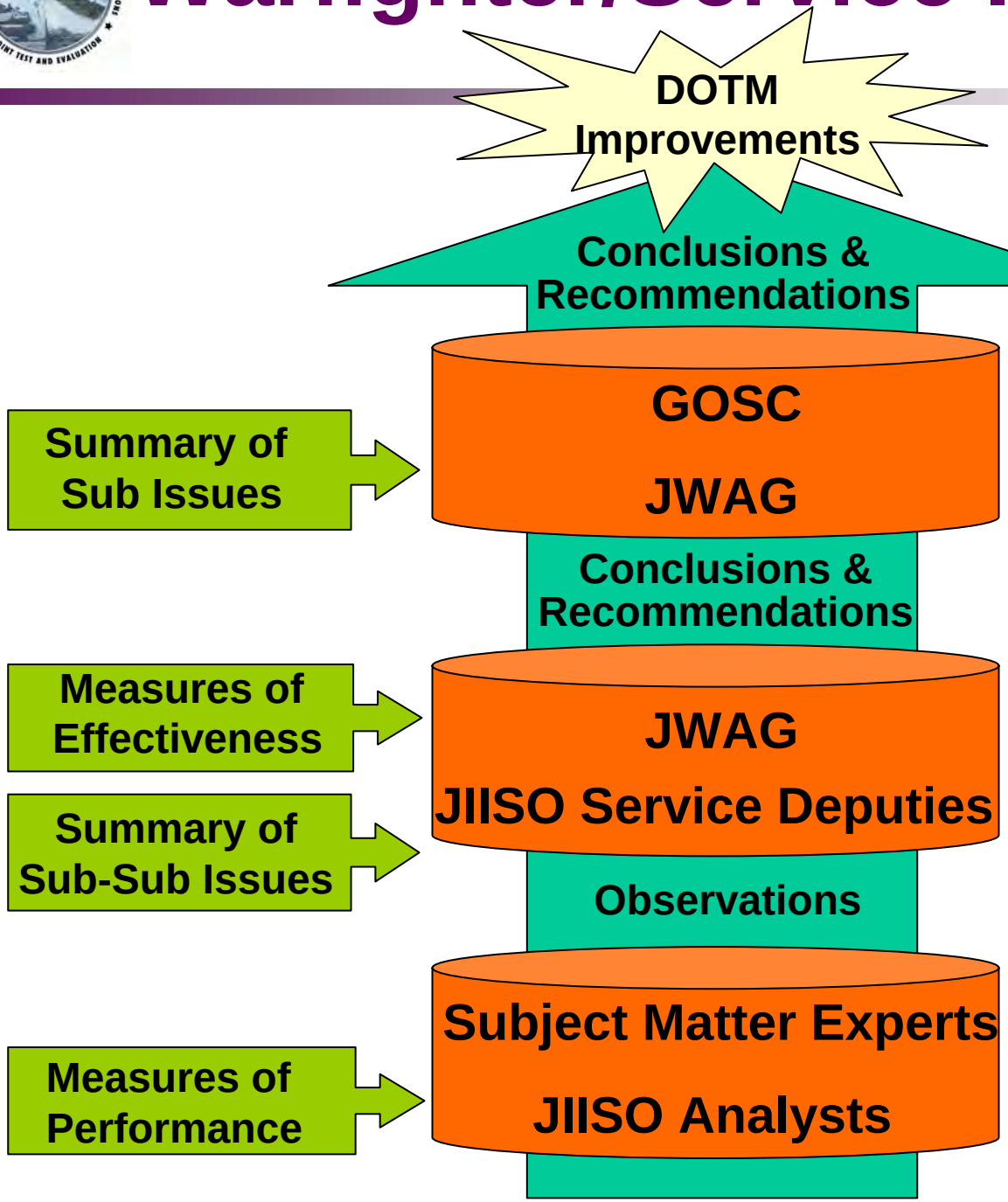
SOF - CF Tactical Situational Awareness Handbook

JIISO JT&E



- **As-Is Deficiencies**
  - Inconsistent data classification
  - Inconsistent system classification
  - Manually discrete track managemen
  - Limited SOF tactical COP
  - Manual LNO track deconfliction
  - Stovepipe COP interoperability
- **JIISO Enhancements**
  - Data classification awareness
  - System classification awareness
  - System interoperability consideration
  - System interoperability work-around
  - SOF track management guidance

Warfighter/Service Involvement



Warfighters and Services validate conclusions and recommendations

- General Officer Steering Committee (GOSC)
- Joint Warfighter Advisory Group (JWAG) - Action Officer Level

Subject matter experts add validity early in the planning and evaluation process through symposiums and workshops

- Select JWAG members – "operators"
- Technical Advisory Group systems expertise

JIISO Early Focus Areas

TTP Focus areas:

- * Planning/Execution for Integrated Maneuver and Fire Support Missions to achieve mutually supporting objectives

Capstone TTP

- Synchronization of SOF/CF fires (surface/air) by maintaining Situational Awareness between SOF/CF
- Dissemination and Management of Control and Coordination Measures between SOF/CF
- TTP for improving the employment of CF Air Support of SOF

Foundational TTP

- SOF/CF Standardized Collaboration
- * Enhanced Situational Awareness through Fires Connectivity
- * SOF/CF Tactical Blue Force Situational Awareness
- * Embedding the AOB inside the CF TOC
- * TLAM Deconfliction with SOF

Enabling TTP

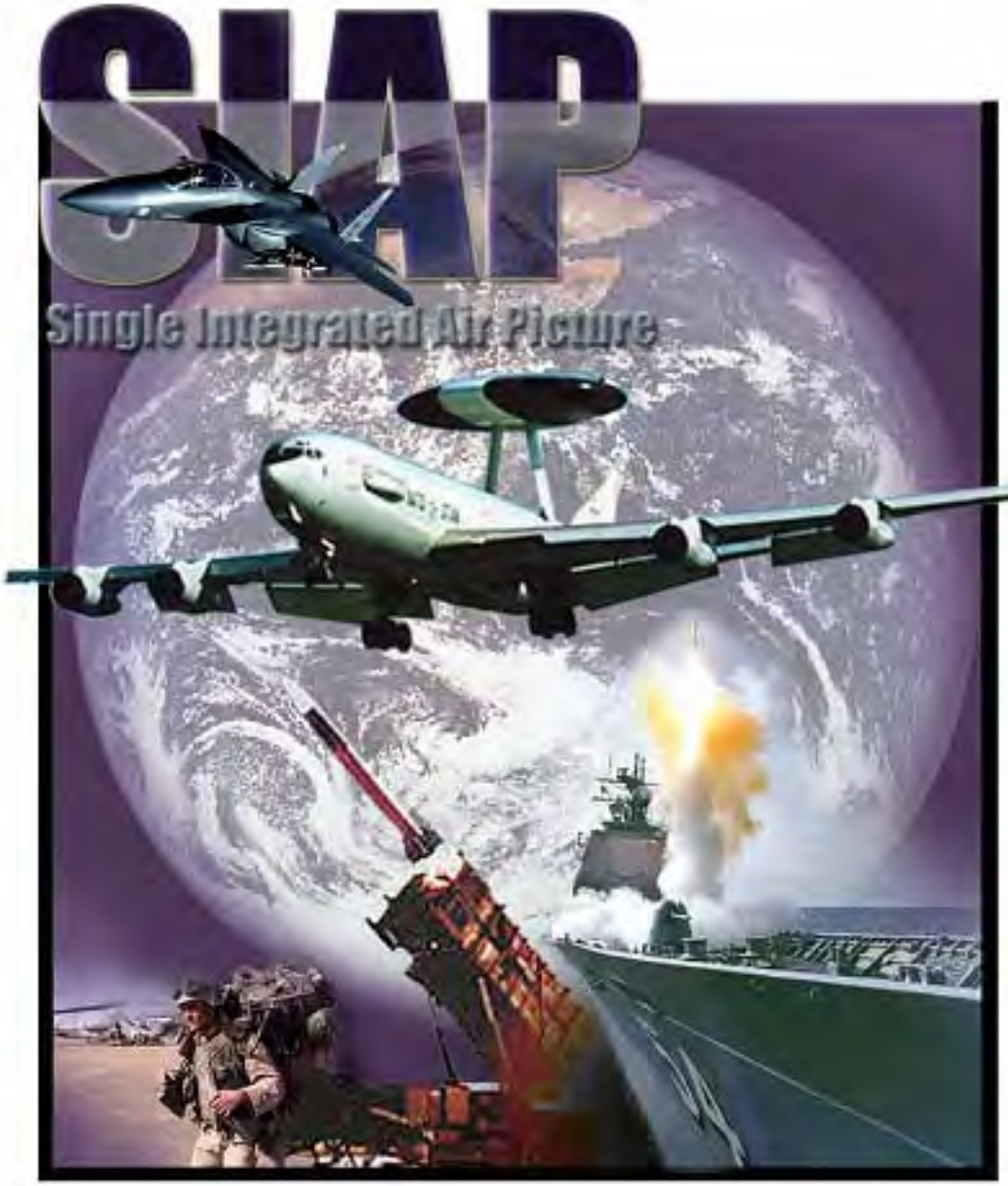
* Expect to implement TTP improvements prior to FT1

Summary

As a result of the JIISO JT&E, the Joint Force Commander's integration and interoperability of SOF and CF during planning and execution of maneuver and fire support coordination will be improved and streamlined with more timely actions and increased opportunities with less potential for fratricide.

Bottom line: JIISO will enable net centric operations through improvements to DOTMLPF.

POC: Mike Dorris
Director, JIISO JT&E
dorrism@socom.mil
813-828-6520



Joint SIAP System Engineering Organization (JSSEO)

Implementing the JBMC2 Roadmap A JSSEO Perspective

23 March 2005

Col Harry Dutchyshyn, USAF
Deputy Director, JSSEO

JSSEO a Strategy for DoD Convergence

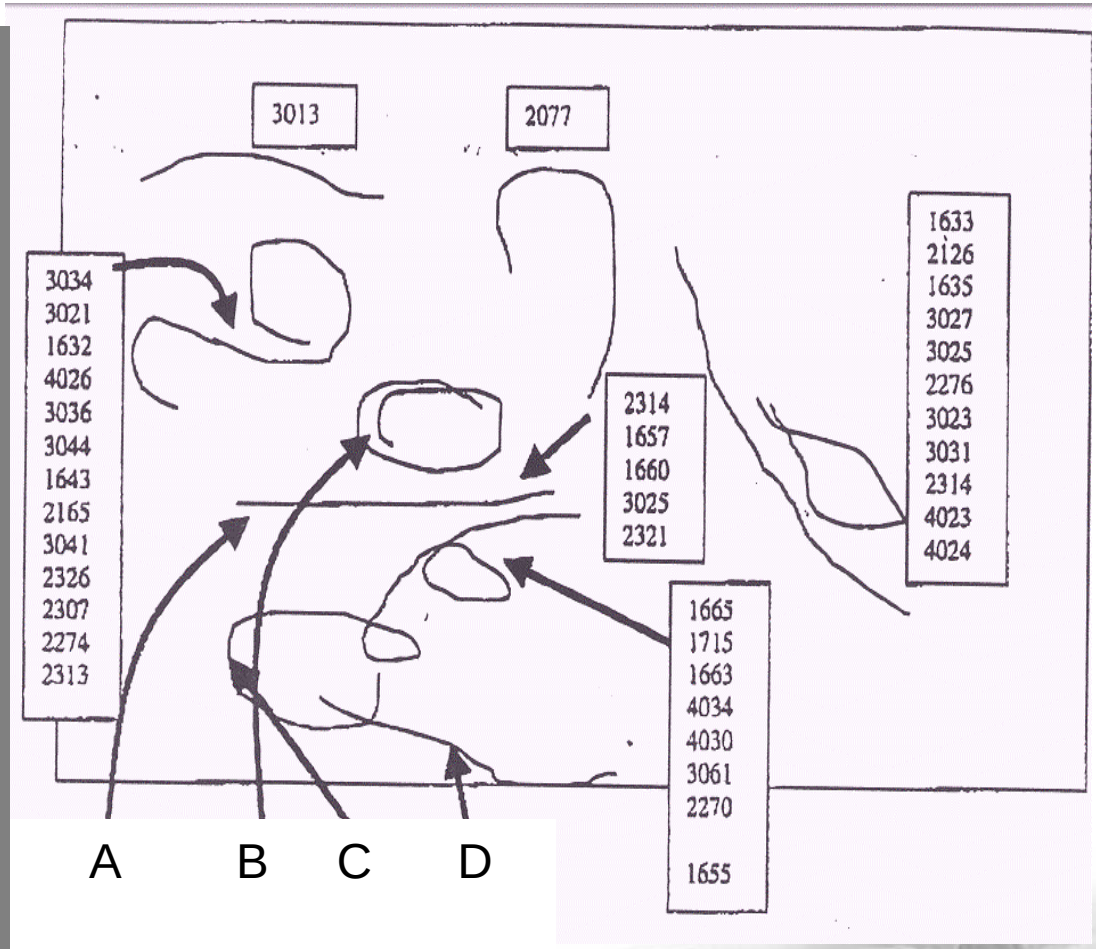
Connecting the dots:

The problem

The strategy & commitments

The challenges

Today's Warfighting Challenge



Today's approach does not satisfy operational objectives

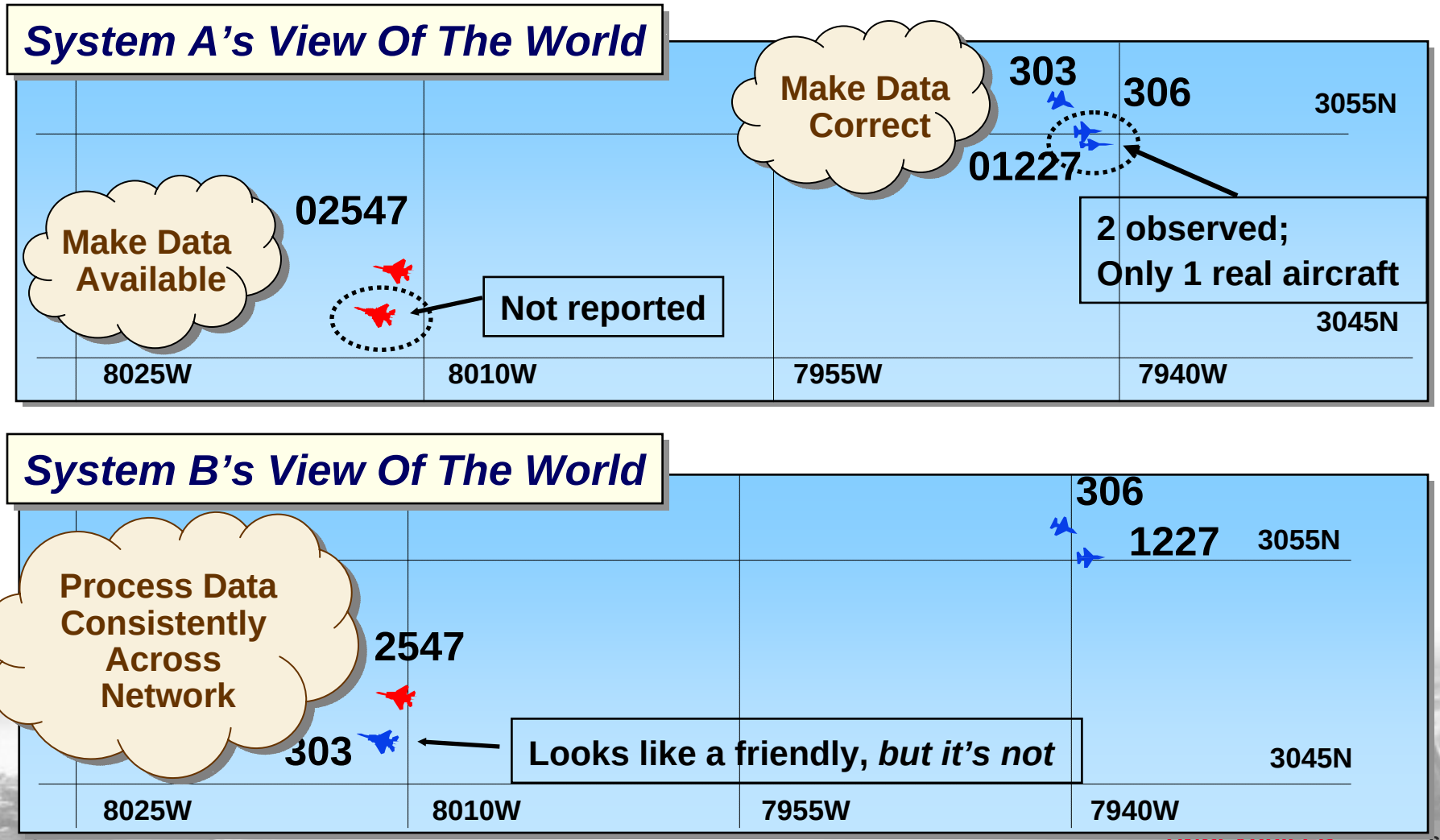
What are the “Deadly Sins”?

- **Time:** Lack of a common time standard
- **Nav:** INS/GPS integration factors
- **Tracking:** Poor tracking performance & inaccurate Track Quality calculations
- **Connectivity:** BLOS relay requirements & throughput limits
- **Gridlock:** Failure to achieve common geodetic coordinate frame
- **ID:** Automated ID processing differences
- **Message standard implementation**
- **JTTP shortfalls**
- **Network design/management shortfalls**

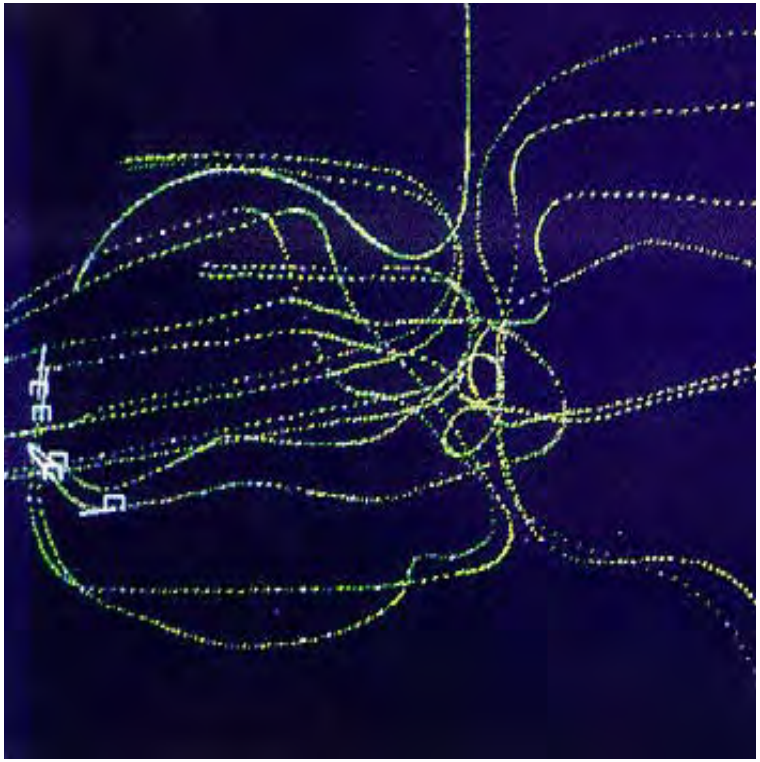
“Deadly Sins” inhibit interoperability

Strategy—the Objective

Getting everyone on the same sheet of music…



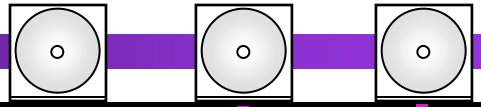
SIAP Attributes—What 'Good' Looks Like

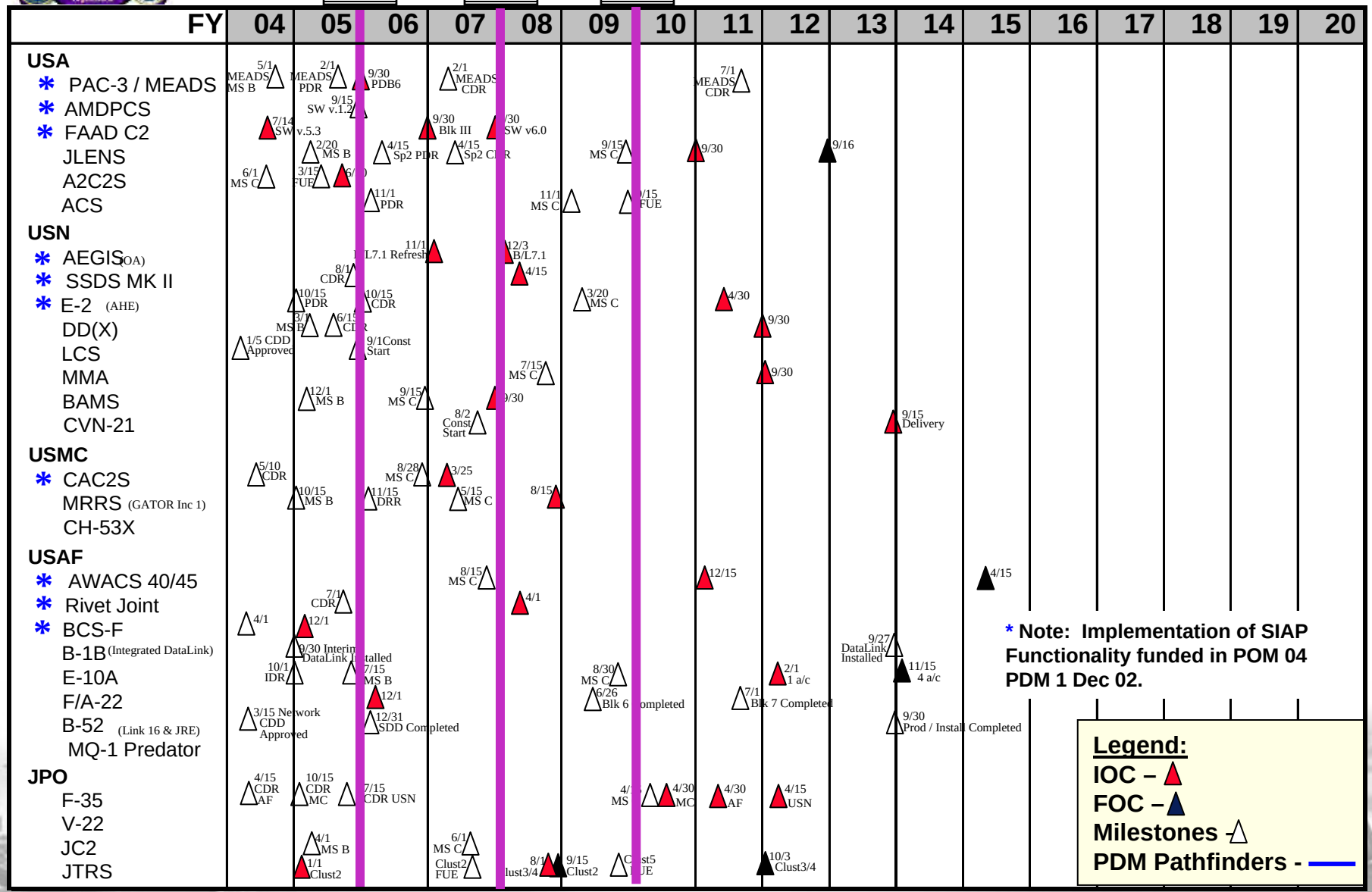


JROC Approved Requirements

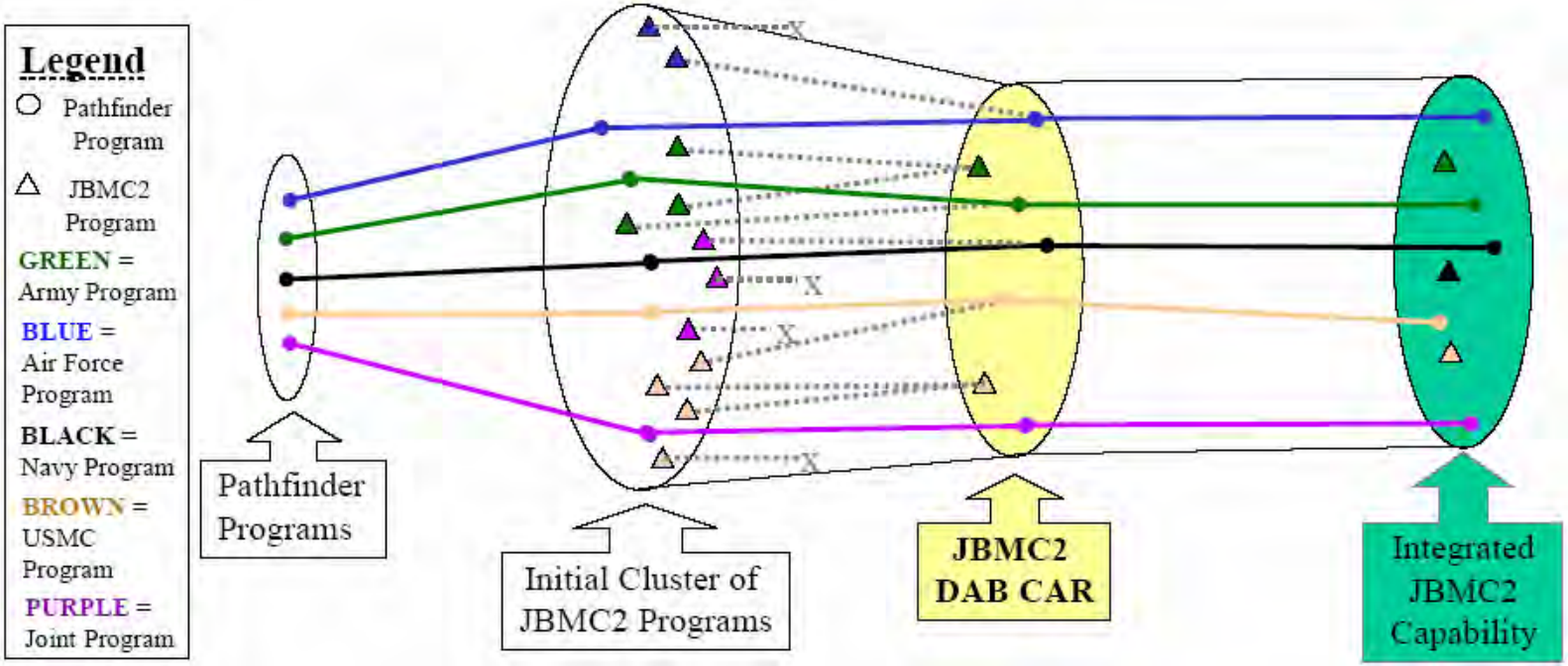
- **Completeness:** The air picture is complete when all objects are detected, tracked and reported
- **Clarity:** The air picture is clear when it does not include ambiguous or spurious tracks
- **Continuity:** The air picture is continuous when the tracks are long lived and stable
- **Kinematic Accuracy:** The air picture is kinematically accurate when the position and velocity of a track agrees with the position and velocity of the associated object
- **ID Completeness:** The ID is complete when all tracked objects are labeled in a state other than unknown
- **ID Accuracy:** The ID is accurate when all traced objects are labeled correctly
- **ID Clarity:** The ID is ambiguous when a tracked object has two or more conflicting ID states
- **Commonality:** The air picture is common when the tracks held by each participant have the same track number, position and ID

Built At a Pace & Level We Can Afford





JBMC2 Capability Area Review



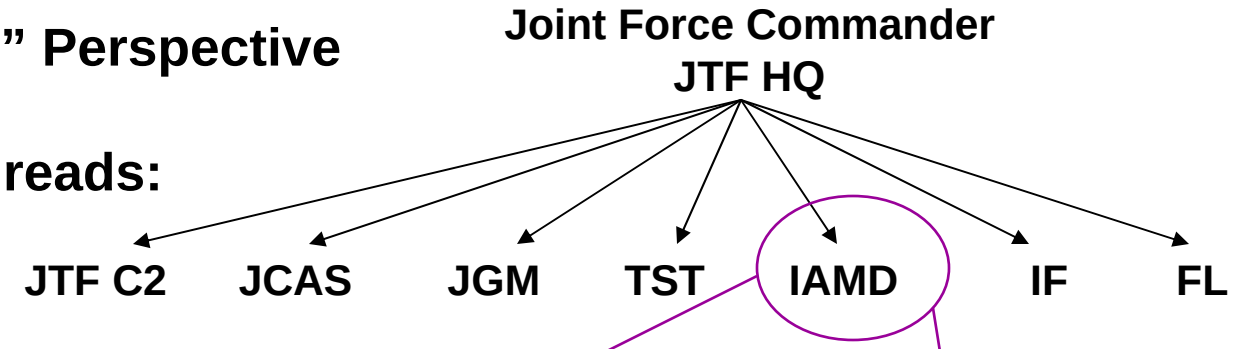
- **Cluster of JBMC2 programs essential to end-to-end performance**
- **Anchored by JBMC2 Pathfinder programs**
- **DAB CARs used to assess progress in developing integrated JBMC2 capabilities**
- **Legacy program phase out and convergence plan approved at DAB CAR**

JBMC2 Architectural Relationship

JBMC2 Architecture:

"Command Post" Perspective

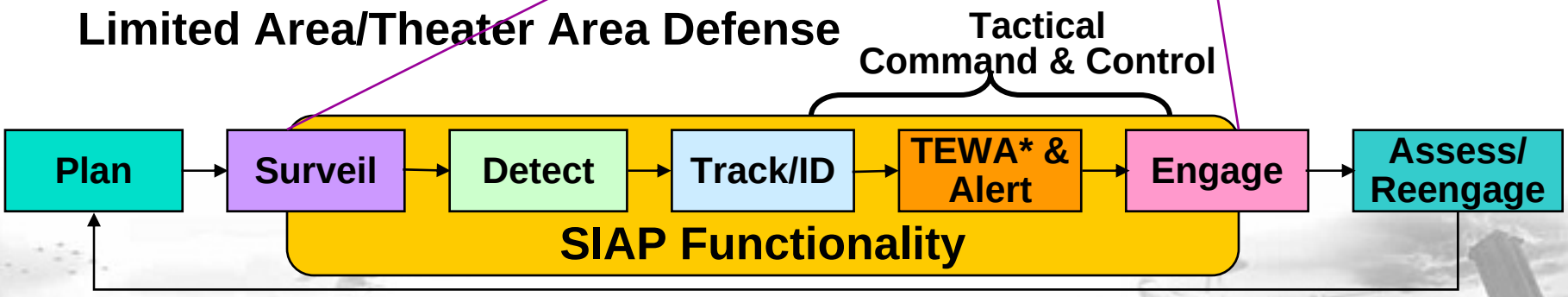
Joint Mission Threads:



IAMD Architecture:

Mission Oriented (functional view):

Limited Area/Theater Area Defense



*Threat Evaluation and Weapons Assignment

Strategy for achieving SIAP capability

Capability achieved through:

1. **Architectural requirements/directives**
   - **A computerized spec**

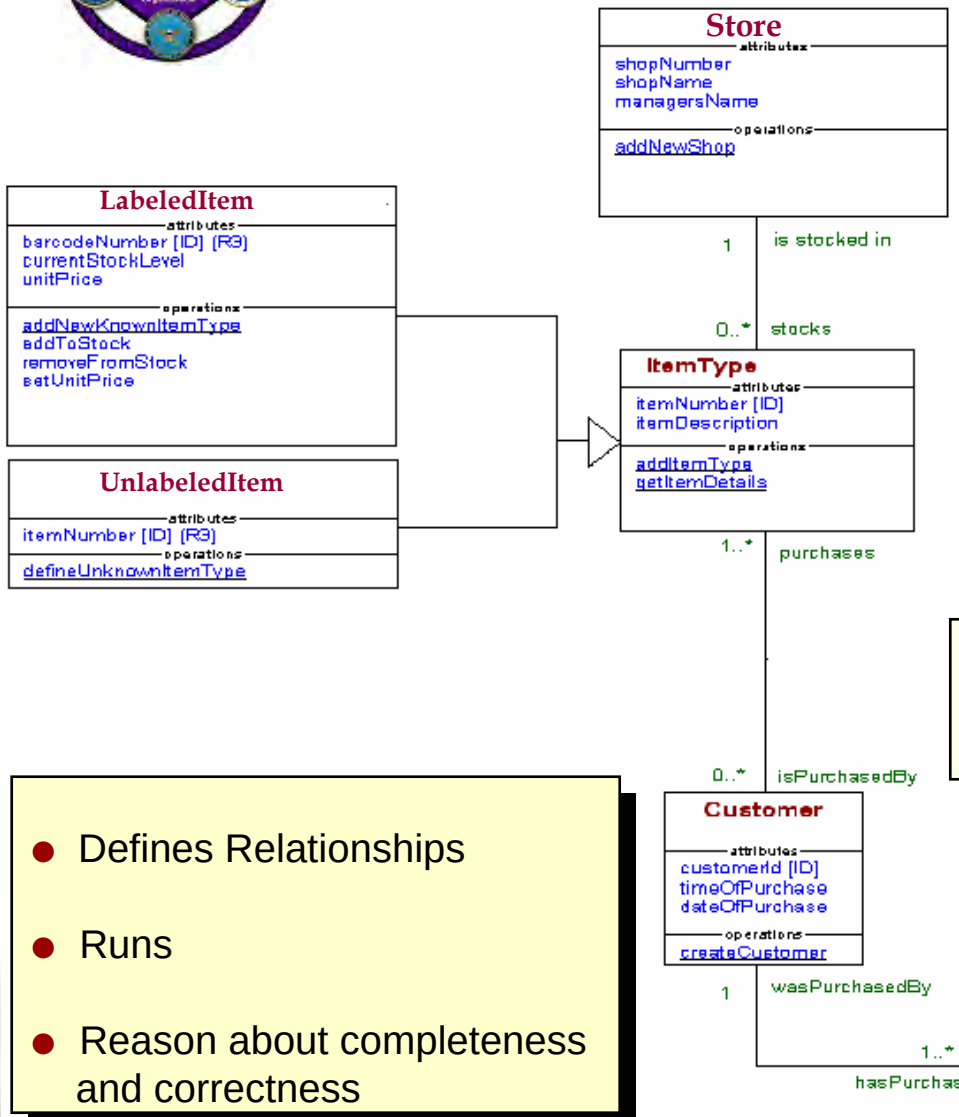
2. **Application of Net-Ready Requirer**
   - **A software Jig**

3. **Service implementation and architecture enforcement through JITC**
   - **A conformance tool**

AMD Capability Area Reviews and JCIDS Process

Using Model Driven Architecture and industrial standards to reduce acquisition costs & provide conformance criteria

Executable UML—A Computerized Spec



- **Industry standard approach - Object Management Group**
- **Separate functionality and implementation**
- **Stabilize design as implementation technologies evolve and improve (platform independent)**

The IABM and "Executable Architecture"

- Defines Relationships
- Runs
- Reason about completeness and correctness

IABM - A Stepping Stone to Service Implementation—A Software Jig

System A
Requirements
Standards

System B
Requirements
Standards

System C
Requirements
Standards

Joint Specification
Requirements
Standards

for (i=0;9; i++)
{a * =sin(i * PI);}

for (i=0;9; i++)
{a * =sin(i * PI);}

for (i=0;9; i++)
{a * =sin(i * PI);}

TDL

Peer-peer

TDL

Function
Track Mgmt
Distributed Resource Mgmt
Data Dissemination Mgmt
Joint C2
Common Services
System Interfaces

JSSEO

Service

An Architecture Conformance Tool

- **IABM runs…testable in a distributed simulation**
- **Known scripts…controls & expected outputs**
- **Standards conformance…MOA signed Mar 05**
  - MOA with JITC to support testing of the IABM as developed by JSSEO and Service implementations of the IABM in combat systems

Provides a mechanism for validating data correctness, data availability and consistent data processing for architecture threads—validates Net-Ready requirement

IABM & Progress

- Services fielding Link 16 correlation & ID fixes
- New strength track reporting ICP (4 Feb 05)
- Created Joint metrics defining SIAP performance
- Shaped Joint Net Ready KPP on data
- Introduced IABM – Executable arch. paradigm
- Released 21 incremental IABM TimeBoxes
- Standardized test planning, executing, & reporting
- Built new tools for enterprise analysis/distributed testing
- Engaged industry in risk reduction contracts to integrate IABM into SIAP pathfinders

Industrial Strategy

- **Broad participation in Joint system engineering**
- **Focused risk reduction with Service Primes**
  - Service risk reduction contracts: BCS, AWACS, LHA
  - JSSEO Industry Risk Reduction--DMEA contract
  - Industry Assessment Team
- **Promote competition with open design & Government maintains control of the specification**
  - Terms of use agreement & classified facility
  - Linkage to industrial standards

Challenges & Risk Reduction

- **Industry Exposure and Risk Reduction**
  - –Objective: Reduce implementation risk by giving industry partners an early peek at PIM to PSM translation, and automated code generation.
  - –May – Oct 04

- **Industry Assessment Team**
  - –Objective: Assess JSSEO Model Driven Architecture approach
  - –2 Aug – 3 Sep 04
  - –Six-man on-site team at JSSEO

Industry Partners

F-15

MC2A

AWACS

NORTHROP GRUMMAN

E-2C

F-18

BOEING

PAC 2 PAC 3

DDG

RC-135

MCE/TAOC

CG

LOCKHEED MARTIN

Patriot ECS

Raytheon

ThalesRaytheonSystems

CAC2S

BCS

LHA/CNI

GENERAL DYNAMICS
Strength on Your Side™

IABM Risk Reduction on contract

Industry Exposure & Risk Reduction

- **Translation worked for each system environment**
  - Clear learning curve for each instance
  - Major dependence on model documentation
  - Insufficient “calibration” data for the exercise
  - Model compiler critical to quality of emitted code
- **Must strengthen industrial standards for MDA tools**
- **Must re-think workforce skill sets & training**
- **Continue to mature test, verification and validation concepts along with Configuration Management**
- **Insufficient insight to validate cost, rates & factors**
  - Limited scope…not integrated into weapon system

Industry Assessment Team Findings

- ***Finding 1:*** Insufficient time devoted to resolving defects and keeping IABM documentation current

✓***Action Taken:*** Bug Top-10, Introduced documentation metric for model development, Added fidelity for Configuration 05 Description Document, IABM TEMP, and IABM User's Guide

- ***Finding 2:*** Code reviews were not always performed.

✓***Action Taken:*** Quality gates in place between each development phase

- ***Finding 3:*** Significant fixed overhead for each TimeBox

✓***Action Taken:*** New 6-week TimeBox developed. Introduced testing automation. Phased integration process reduces troubleshooting overhead.

Industry Assessment Team Findings *cont.*

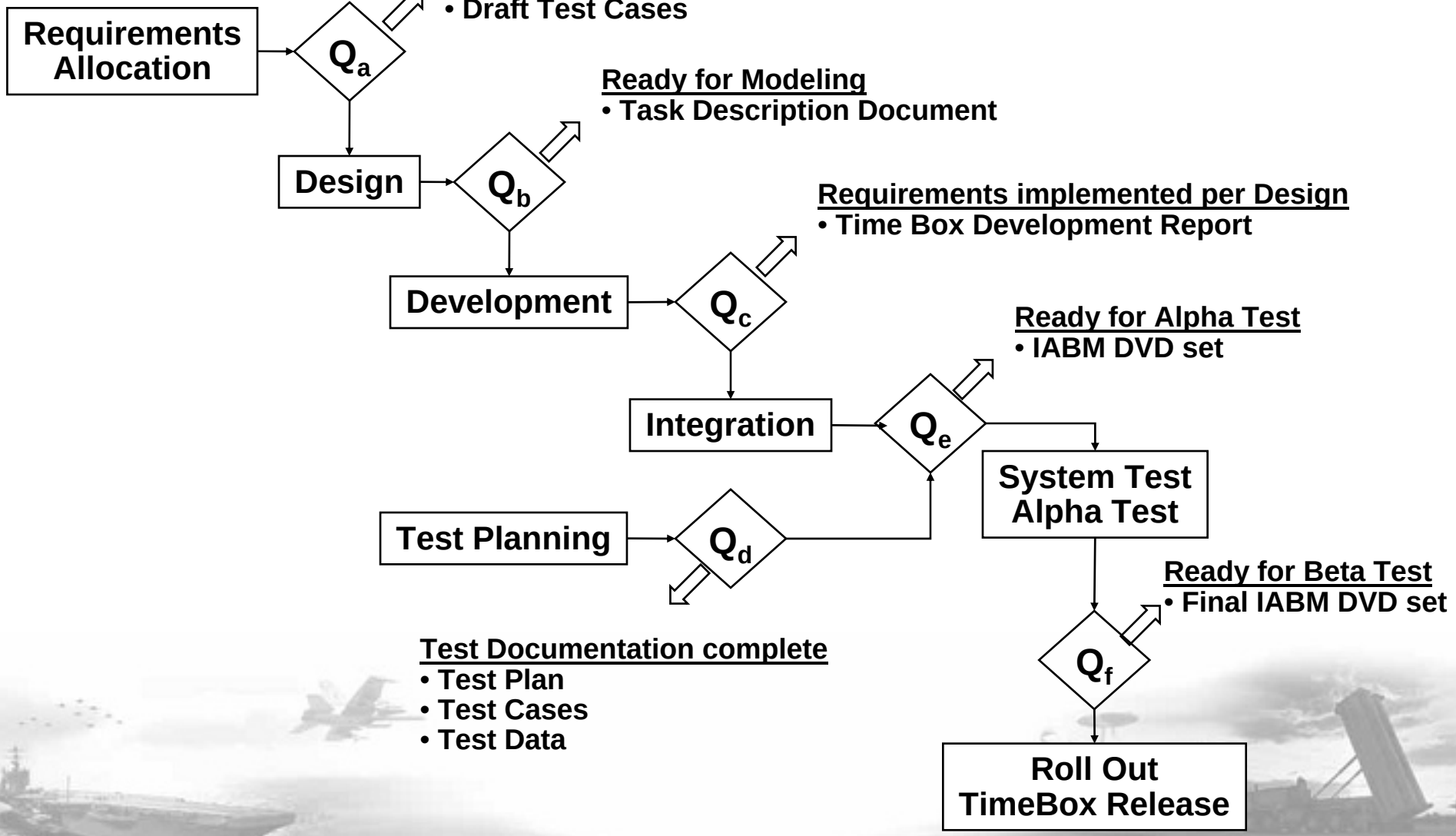
- ***Finding 4:*** TimeBoxes were delivered to beta sites at the same time they went to QA.

✓**Action Taken:** Alpha test sites identified; TimeBoxes released to Beta sites after Alpha testing is complete

- ***Finding 5:*** IABM requirements were not fully traceable to the operational requirements.

✓**Action Taken:** Requirements database created in DOORS and trace developed to lower level requirements, architecture, and IABM.

Implementing Industry's Advice



Industry Assessment Conclusions

- **SIAP is highly innovative and bold project**
  - Application of MDA practices
  - Acquisition model
- **SIAP IABM is an extensive application of MDA**
- **SIAP is applying MDA standards and can influence the evolution of the standards**
- **The JSSEO team is highly motivated, skilled, and open minded**
- **JSSEO is experiencing the natural learning curve**
- **SIAP MDA approach offers significant potential to achieve its objectives for interoperable and maintainable systems**

From SIAP Concept to Capability

- Combat scenarios, operational concepts and mission area ICDs drive the IAMD architecture and define mission threads
- Net-Ready KPP links Service systems to the IAMD architecture
- A computerized spec (the IABM) captures the behavior of the IAMD architecture and provides an executable template for what “good” looks like
- Services use this model/template as a software jig to create computer programs that conform to the IAMD architecture
- Service OTAs and JITC compare system performance to computerized spec (IABM) to validate architectural conformance and certify satisfaction of Net Ready KPP requirements

It’s about engineering the ensemble…

Using the IABM

It's about the data

- Make it correct
- Make it available
- Process it consistently

"Net Ready" Requirement

Behavior Model is our strategy

- Interoperability improvements
- Life-cycle cost avoidance
- Reduced time to field new and modified capability

…and improving our decision making processes…

To improve Joint warfighting

What the Warfighter Gets:

- Confidence in Tracking Targets & Friends
- Flexibility to Engage on Our Terms
- Robustness for Reacting to Change

To Achieve What Effects:

- Exploit our weapons at their full kinematic range
- Reduce the risk of fratricide
- Counter emerging threats

…to field Joint warfighting capabilities implemented by the Services at a pace and level we can afford

Department of the Navy

Office of the Assistant Secretary of the Navy
(Financial Management and Comptroller)

Achieving Business Transformation

The Road to a "Clean Financial" Opinion

The Department of the Navy Approach

Mark Easton

NDIA Conference

March 22, 2005

Today's Systems Environment

- Too many systems
  - Redundant, stove-piped
  - Poor integration, interoperability
  - No standard data structures
- Limited visibility in budget
  - Discrete elements of spending lacking
- Difficult to support technologically
- Difficult to audit

Framework for DON Business Transformation

- DoD Business Enterprise Architecture… **Blueprint**
  - Standardize business processes & provide data standards
  - Requires systems portfolio management
- Navy ERP… **Cornerstone**
  - Implement a modern, integrated COTS software product
  - Reengineer business processes
- Functional Area Manager Process… **Transition Tool**
  - Rationalize FM and Business systems… portfolio management
  - Standardize business processes
- DoD Financial Improvement Initiative… **Integrating Plan**
  - Considers/integrates elements of Systems, Processes and Human Capital
  - Documents Business Processes for Audit

Successful Business Transformation Will Support Auditable Financial Statements

DoD Business Enterprise Layer

Data Standards, Common Capabilities,

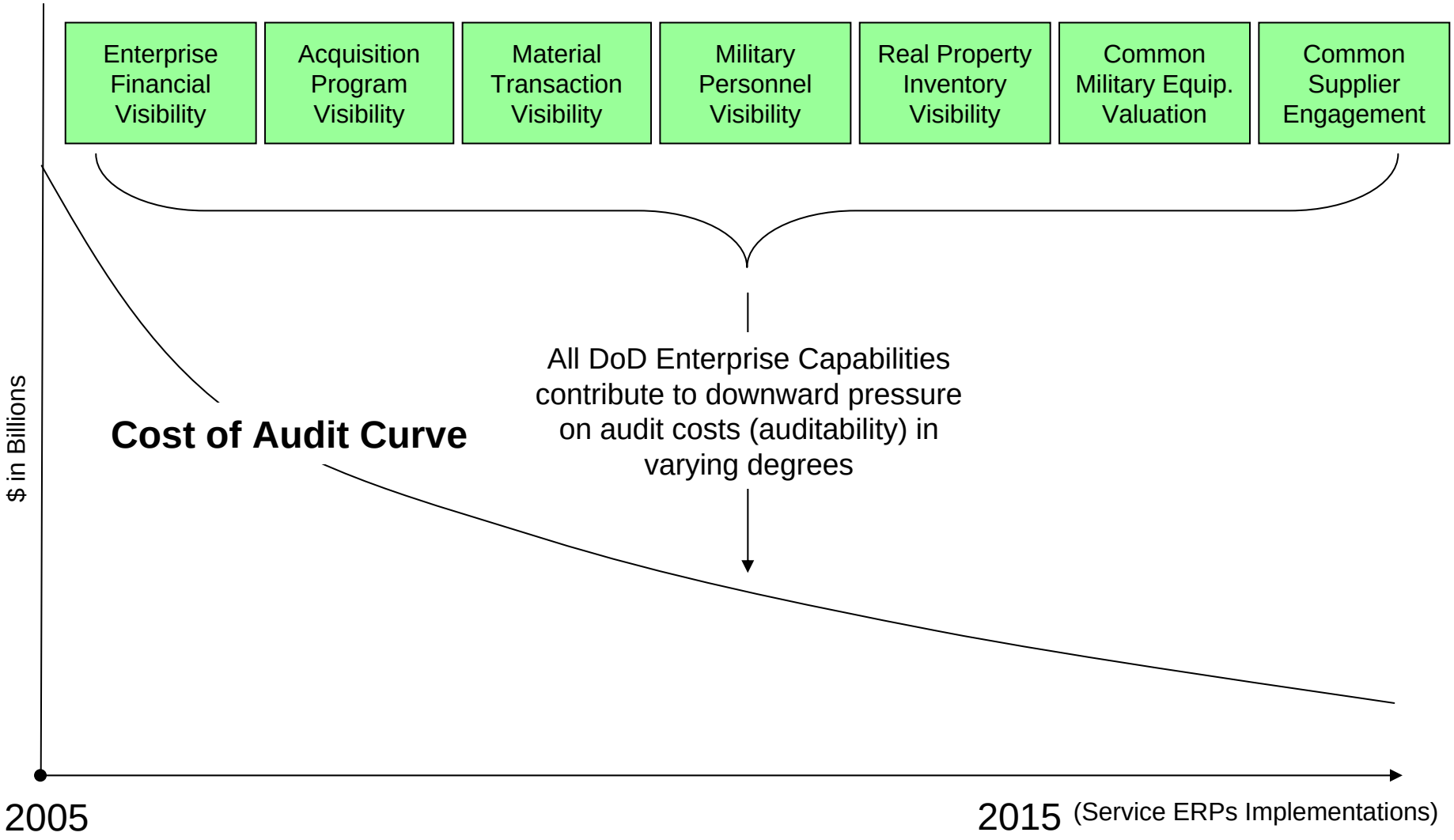
Transformation “Catalysts”

Enterprise Financial Visibility	Acquisition Program Visibility	Material Transaction Visibility	Military Personnel Visibility	Real Property Inventory Visibility	Common Asset Valuation	Common Supplier Engagement

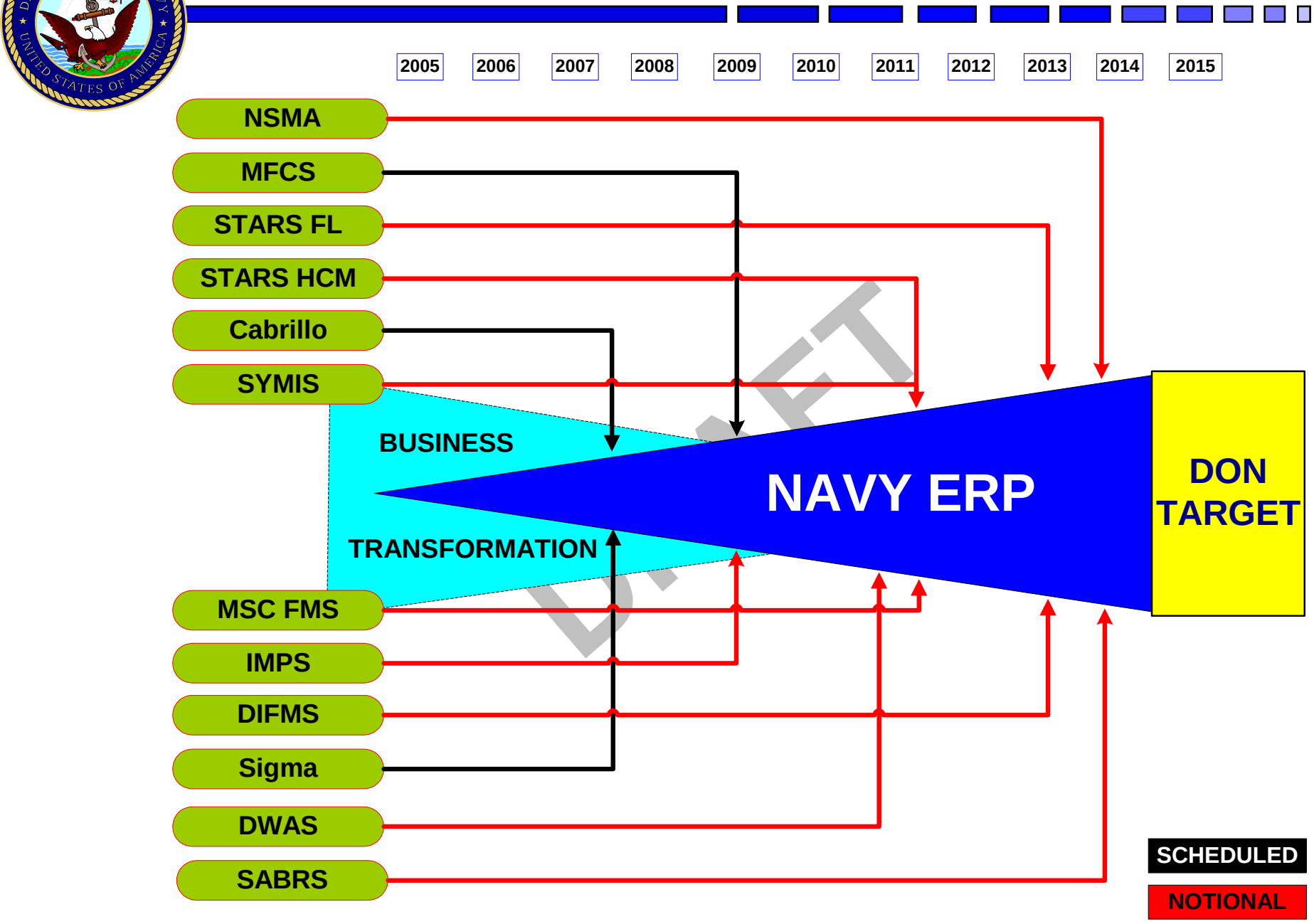
- DDRS
- DCD/DCW
- SFIS
- IGTS
- DCAS
- PB Framework
- Global Edit Table
- Funds Control
- Commitment Acctg
- Cost Acctg Methodology

Critical Enabling Initiatives/Programs (preliminary view)

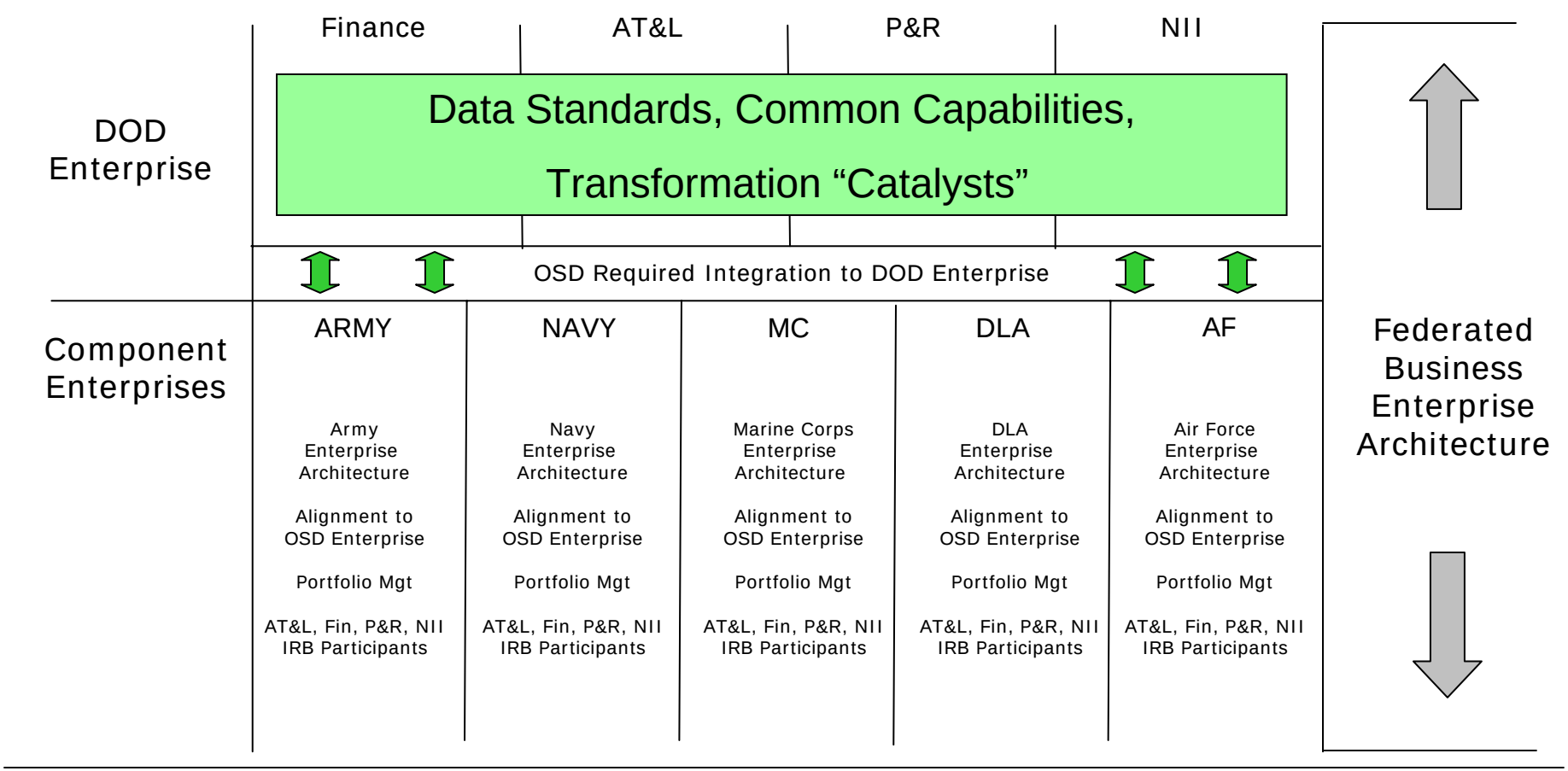
Enterprise Priorities – Auditability Impact



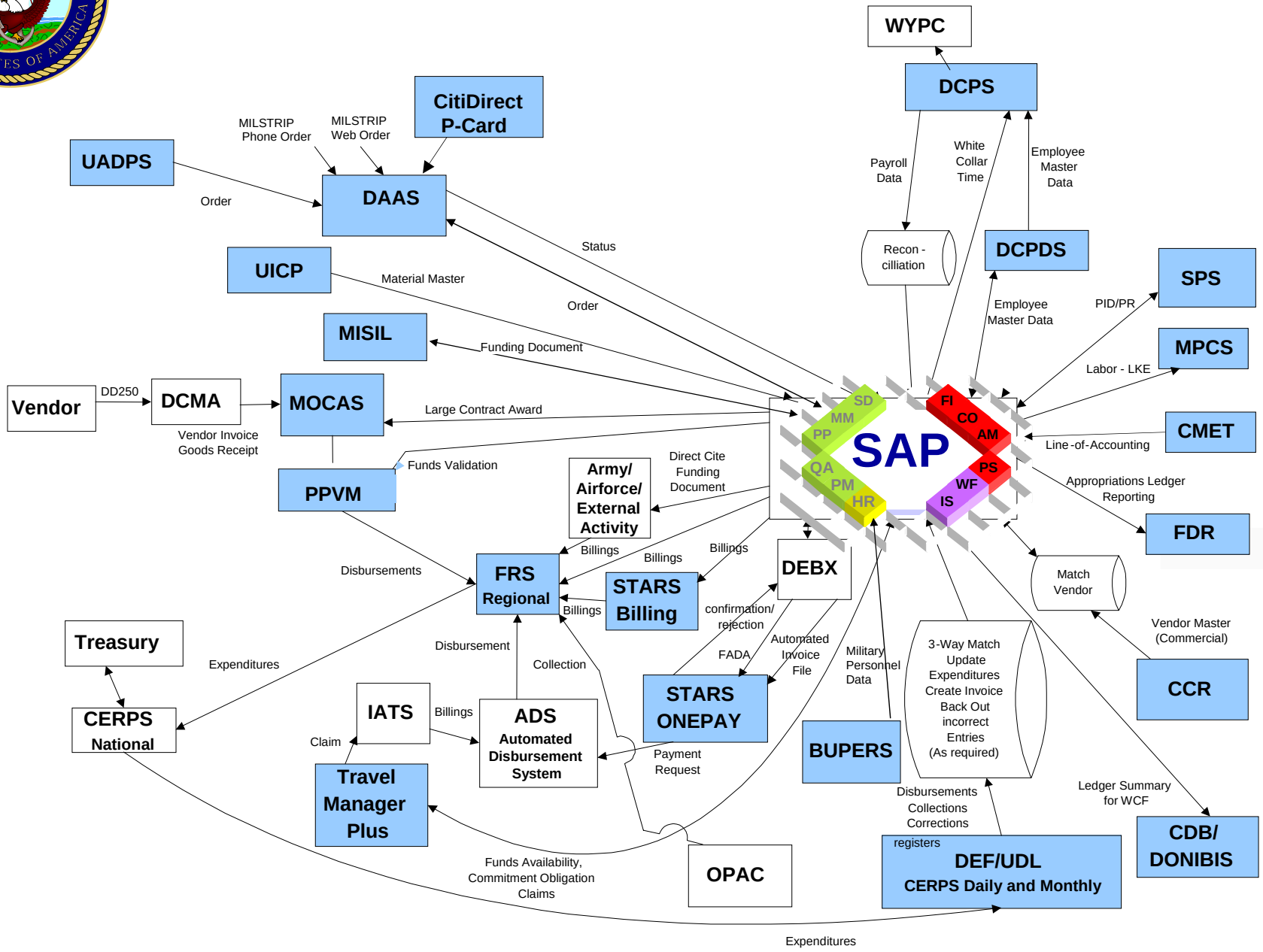
Navy Systems Transition Summary



Defining the DoD Business Enterprise



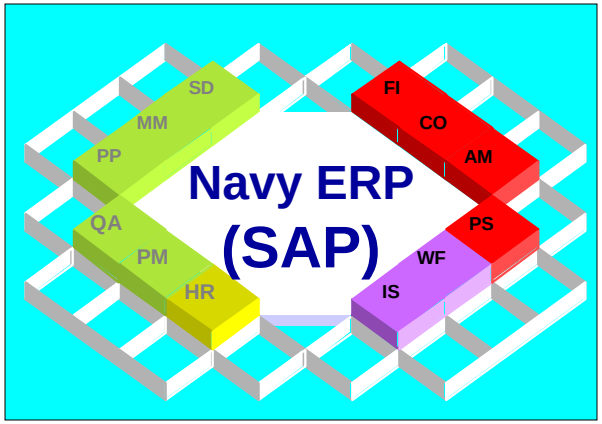
Today


WYPC
DCPS
CitiDirect P-Card
MILSTRIP Phone Order
MILSTRIP Web Order
UADPS
Order
DAAS
Payroll Data
White Collar Time
Employee Master Data
Recon - cilliation
DCPDS
Status
UICP
Material Master
Order
SPS
PID/PR
Employee Master Data
MISIL
Funding Document
MPCS
Labor - LKE
Vendor
DD250
DCMA
MOCAS
Large Contract Award
Vendor Invoice Goods Receipt
SD
MM
PP
QA
PM
HR
FI
CO
AM
PS
WF
IS
SAP
CMET
Line -of-Accounting
Funds Validation
PPVM
Army/ Airforce/ External Activity
Direct Cite Funding Document
Appropriations Ledger Reporting
FDR
Billings
Billings
Billings
Disbursements
FRS Regional
STARS Billing
DEBX
Match Vendor
Billings
confirmation/ rejection
Vendor Master (Commercial)
Treasury
Disbursement
Collection
FADA
Automated Invoice File
Military Personnel Data
3-Way Match Update Expenditures Create Invoice Back Out incorrect Entries (As required)
CCR
Expenditures
CERPS National
IATS
Billings
ADS Automated Disbursement System
STARS ONEPAY
Claim
Payment Request
BUPERS
Travel Manager Plus
Disbursements Collections Corrections
Ledger Summary for WCF
CDB/ DONIBIS
registers
Funds Availability, Commitment Obligation Claims
OPAC
DEF/UDL CERPS Daily and Monthly
Expenditures

Future

Material/Product Visibility

Personnel Visibility DIMHRS/ CIVPAY



Treasury/ Financial Reporting

SPS/Common Supplier Suite

Future Environment Supported by Net-Centric Principles

Challenges

- Understanding/Applying BMMP Principles
- Instituting clear DON Leadership over business process transformation
- Change Management and Communication
- Coordination/Cooperation between Technical (CIOs) – Business Managers (COOs) – Resource Managers (CFOs)

DoD Organization and Culture Make These Even <u>More</u> Challenging

NDIA NCOI&SI Conference

JBMC2 Roadmap Implementation

Dr. V. Garber
Director, Systems and Mission Integration
OUSD (AT&L)/Defense Systems
Vitalij.Garber@osd.mil
(703) 695-9713

Changing World – *Changing Operational Need*

- **Past – "non-real-time" diplomatic communications**
  - **Exchanging radio operators**
- **Today – "real-time" need for decisions at all levels**
  - **Political consultations**
  - **Joint and Combined Operations**
  - **Multinational and multi-agency operations**
  - **Integrated logistics – to include private sector**

How to address the Challenge?

- **Integrate – make interoperable our own national efforts**
- **Ensure they are “alliance and coalition friendly”**
- **Ensure they build on the global commercial and industrial sectors (particularly information technology, supply and maintenance, and transportation sectors)**

What have we learned in recent operations?

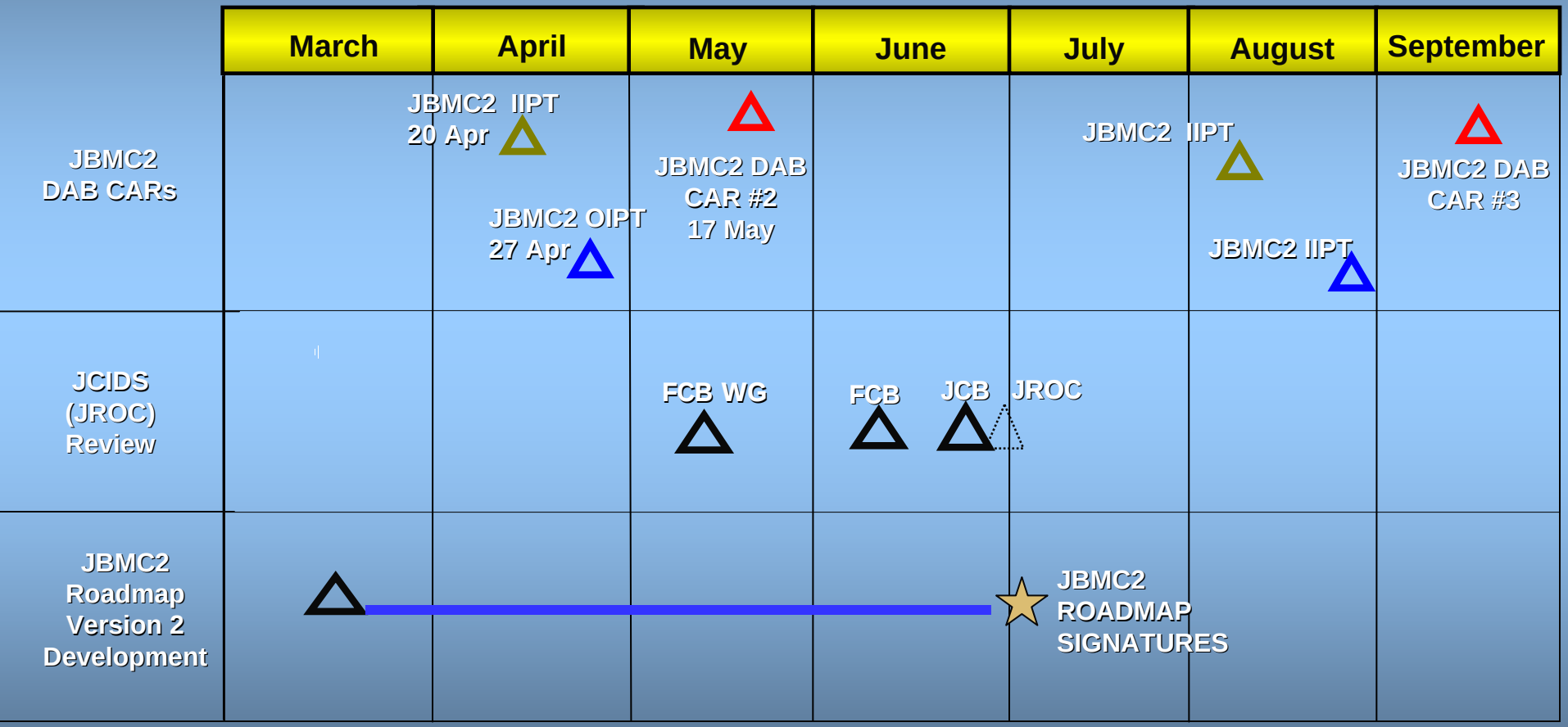
- **Afghanistan**
- **OIF**
- **Tsunami Relief**

"For effective operations, and to avoid fratricide and related tragedies, we will need to move to a global interoperable C2 systems to be tailored by those in charge of a given operation." (Regional Commander)

What are some of the key initiatives?

- **Net centric underpinning**
- **JBMC2 / C4ISR**
- **Importance of tactical (small unit) level**
- **Coalition interoperability *(Industry is Key!)***

Roadmap Implementation Timeline



JBMC2 DAB CAR #2 Issues Focus

- Governance, Management and Service Implementation Plans
  - SIAP Implementation
  - Achieving an unambiguous ground and maritime picture
- T&E Strategy and Plans
- Legacy Assessments
- Implementation Barriers

Fighting the Networked Force

Presentation to
NDIA Network Centric Operations Conference
21 March 05

Mr. John J. Garstka
Asst. Director for Concepts and Operations
Office of Force Transformation
Office of the Secretary of Defense
(703) 696-5713
john.garstka@osd.mil
www.oft.osd.mil

Bottom Line Up Front

- **Network Centric Warfare (NCW)**
  - **An Emerging Military Response to the Information Age**
  - **Maturing capabilities demonstrated during OEF/OIF**
  - **Evolving evidence base provides insight into capabilities of networked forces**
- **NCW Implementation**
  - **Not just about technology**
  - **Involves all lines of development**

A US Transformation Goal: Desired Attributes of a Transformed Joint Force

Office of Force Transformation

- **Fully Integrated:**
  - All DoD component capabilities are born joint and are able to integrate into a focused effort with a unified purpose
- **Networked:**
  - Linked and synchronized in time and purpose— allowing dispersed forces to communicate, maneuver, and share a common operating picture
- **Adaptable:**
  - Forces that are tailorable and scalable, prepared to quickly respond to any contingency
- **Expeditionary:**
  - Rapidly deployable, employable, and sustainable—regardless of anti-access, or area denial environments
- **Decision Superior:**
  - Gain and maintain information superiority to shape the situation or react to changes
- **Decentralized**
  - Uses collaborative planning and shared knowledge to empower subordinate commanders to compress decision cycles
- **Lethal**
  - Capability to destroy an adversary and/or his systems in all conditions and environments

Source: United States Armed Forces - Joint Operations Concepts (JOpsC)

How a Networked Force Operates: Network Centric Operations

Office of Force Transformation

Creates an Information Advantage and translates it into a decisive Warfighting Advantage

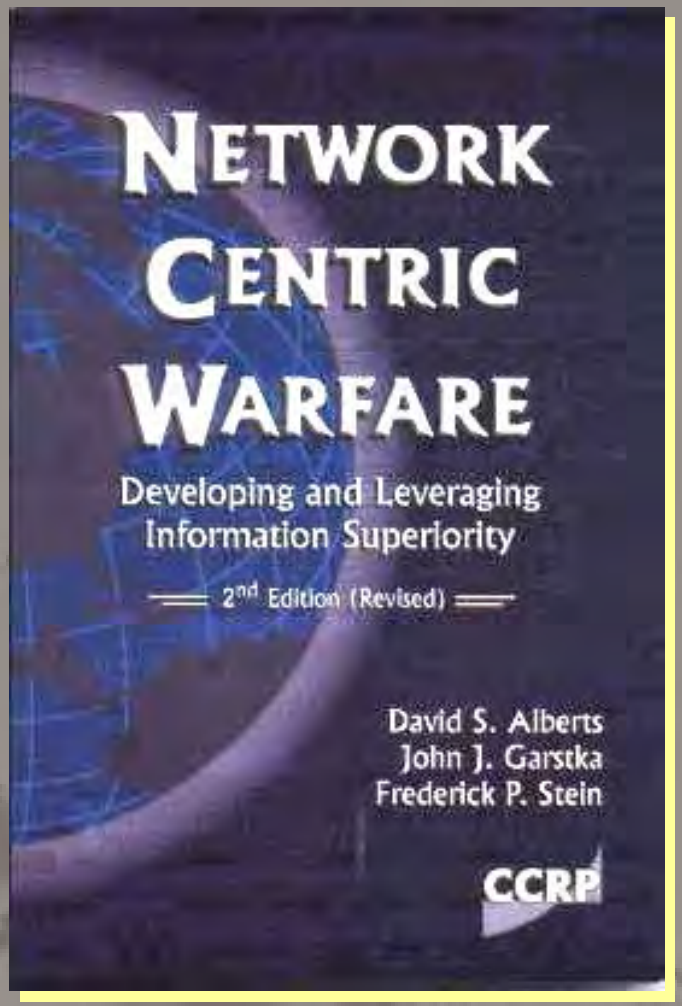
Information Advantage - enabled by the robust networking of well informed geographically dispersed forces

Characterized by:

- **Information sharing**
- **Shared situational awareness**
- **Knowledge of commander's intent**

Warfighting Advantage - exploits behavioral change and new doctrine to enable:

- **Self-synchronization**
- **Speed of command**
- **Increased combat power**



Exploits Order of Magnitude Improvement in Information Sharing

Domains of Warfare

Office of Force Transformation

Shared Situational

- **Understanding**
- **Awareness**
- **Assessment**

Social Domain

Leadership
Unit Cohesion
Morale

Situational

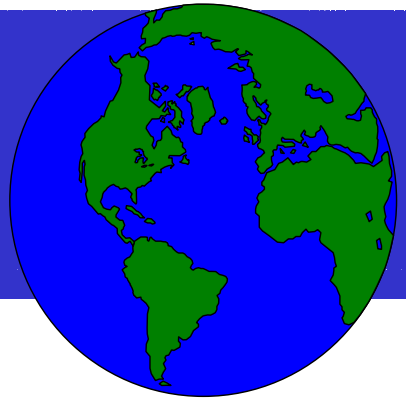
- **Understanding**
- **Awareness**
- **Assessment**

Mind of the Warfighter

Cognitive Domain

Where Information is Created , Shared …..

Information Domain



Strike
Maneuver
Protect

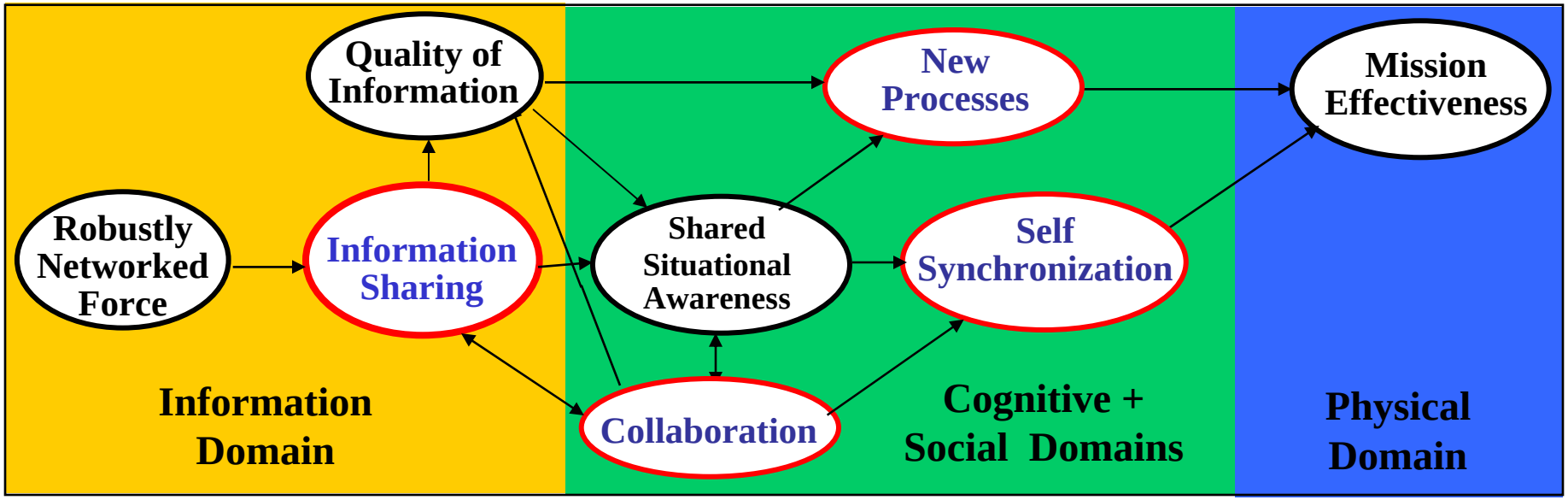
Physical Domain

Tenets of Network Centric Operations

…The New Value Chain

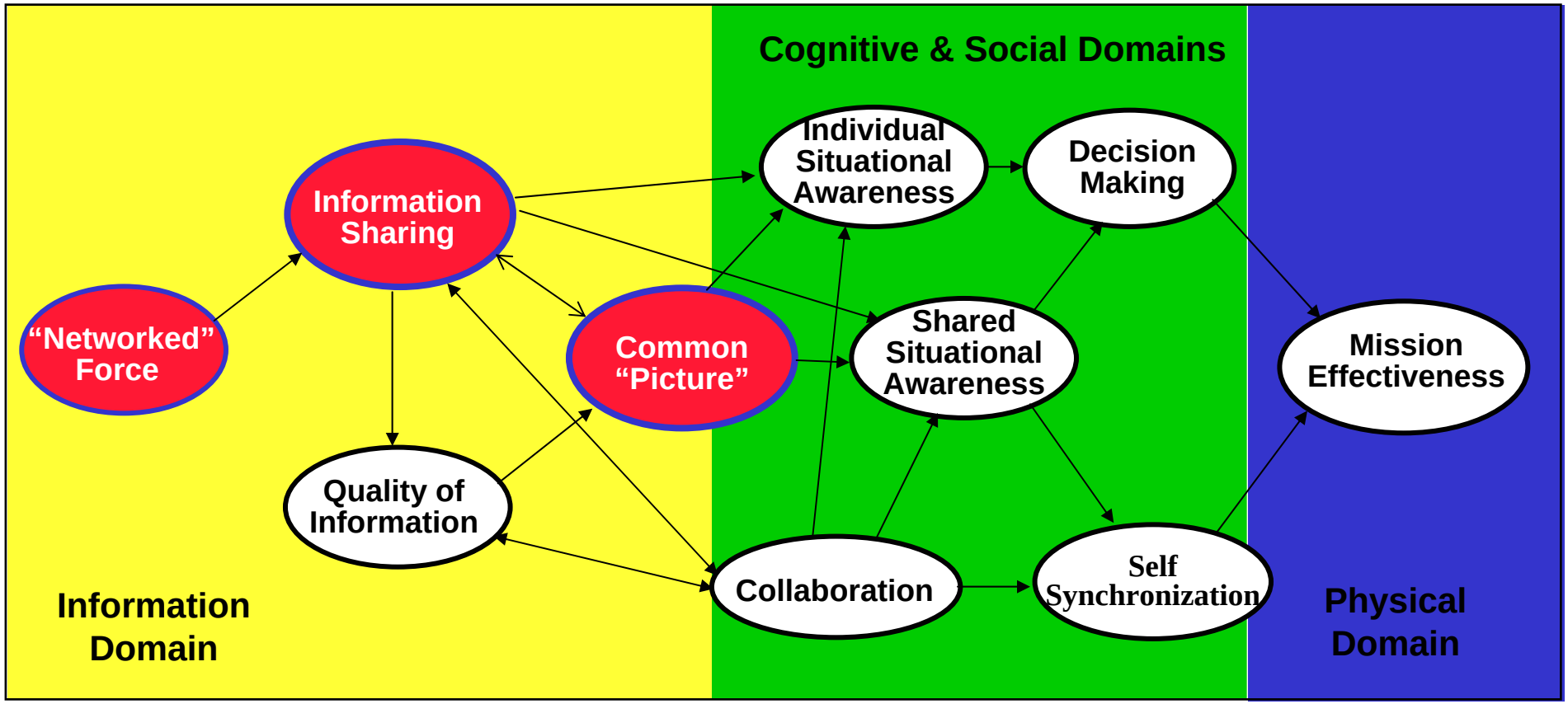
Tenets of NCW: A Hypothesis Regarding Sources of Power

- A Robustly **Networked Force Improves Information Sharing**
- Information Sharing And Collaboration **Enhances the Quality of Information** and **Shared Situational Awareness**
- Shared Situational Awareness **Enables Collaboration** and **Self Synchronization** and Enhances Sustainability and **Speed of Command**
- These in Turn **Dramatically Increase Mission Effectiveness**

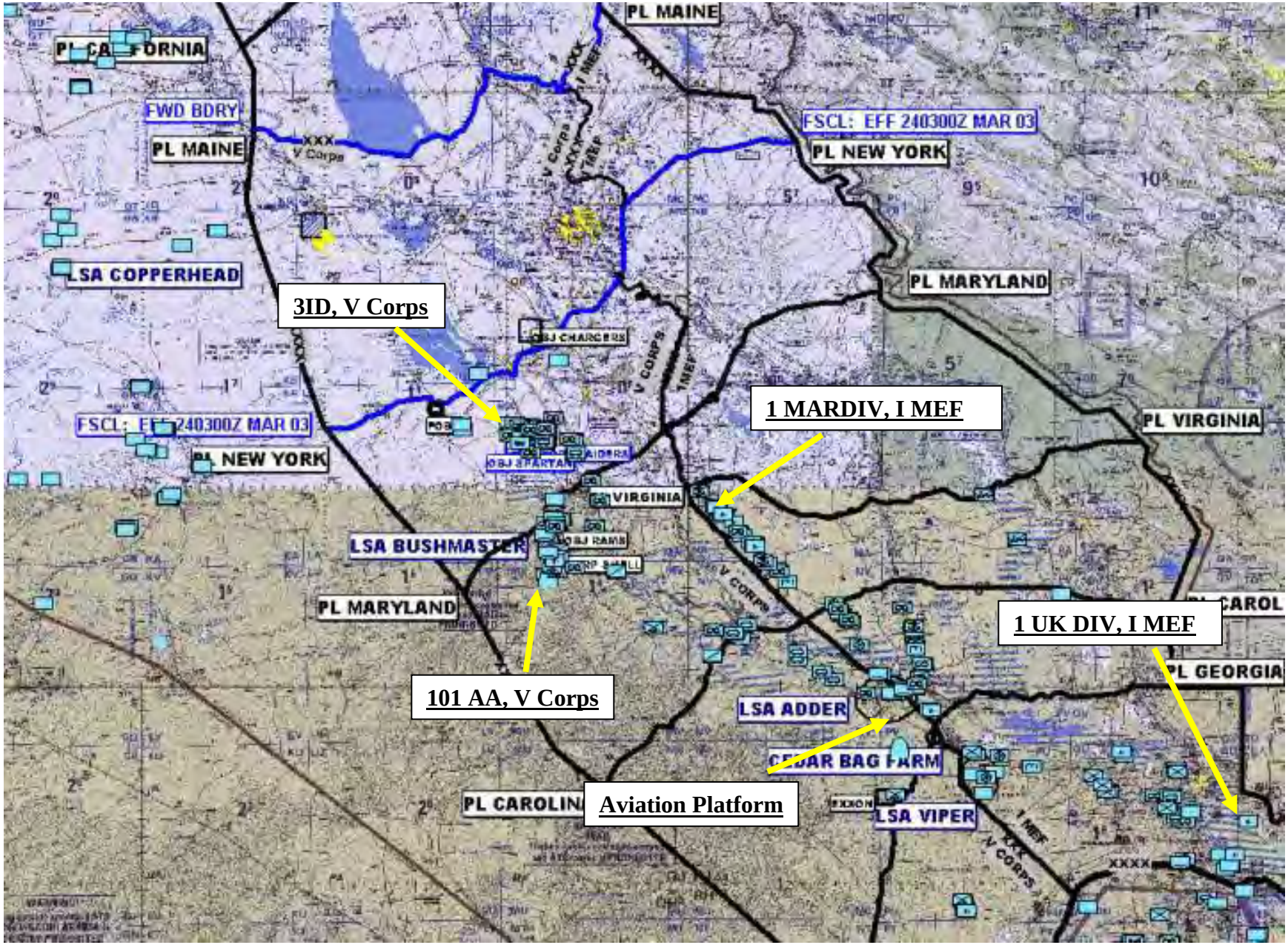


Ground Maneuver during Operation Iraqi Freedom: Key NCW Relationships

Office of Force Transformation

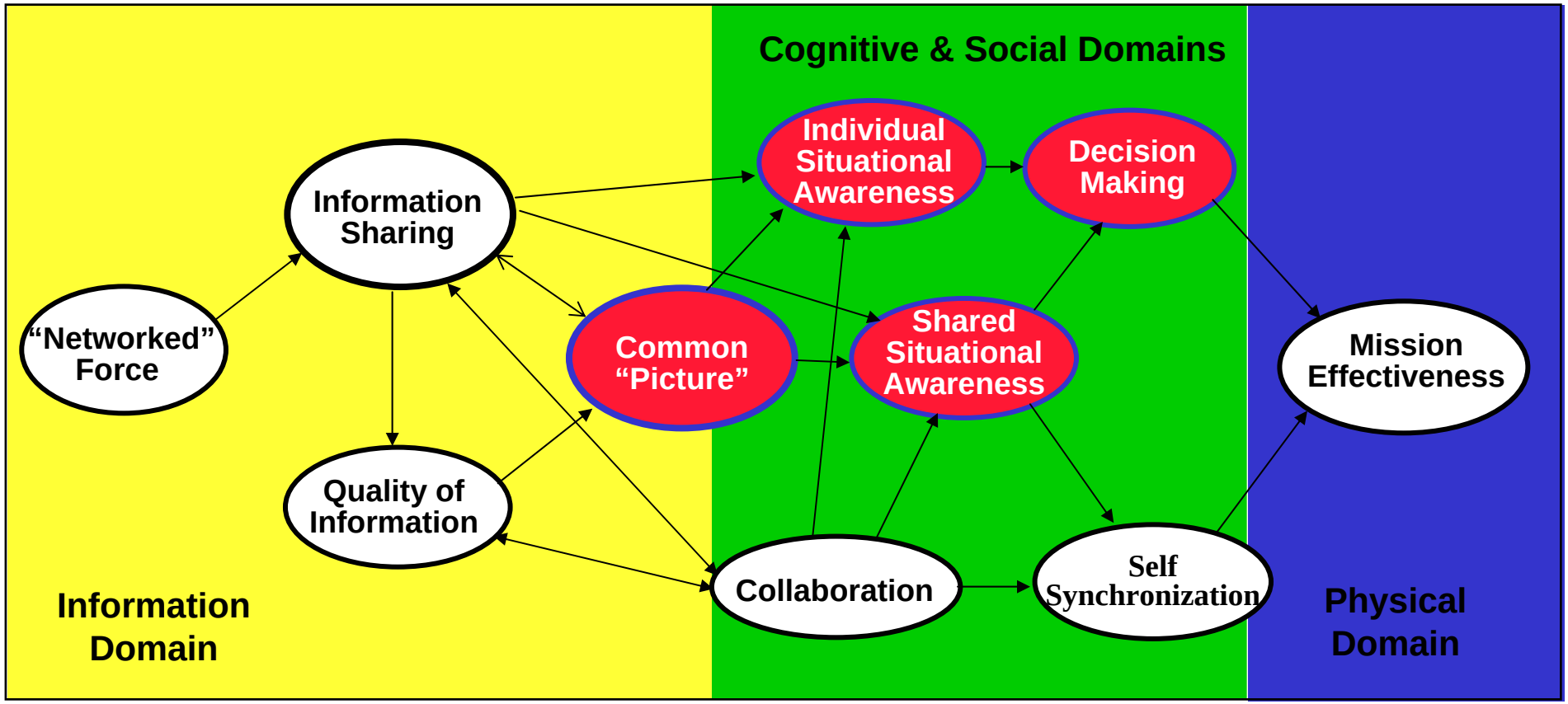


Common Operational Picture (Blue Forces)
OIF - 25 March 2003 (D+6)



Ground Maneuver during Operation Iraqi Freedom: Key NCW Relationships

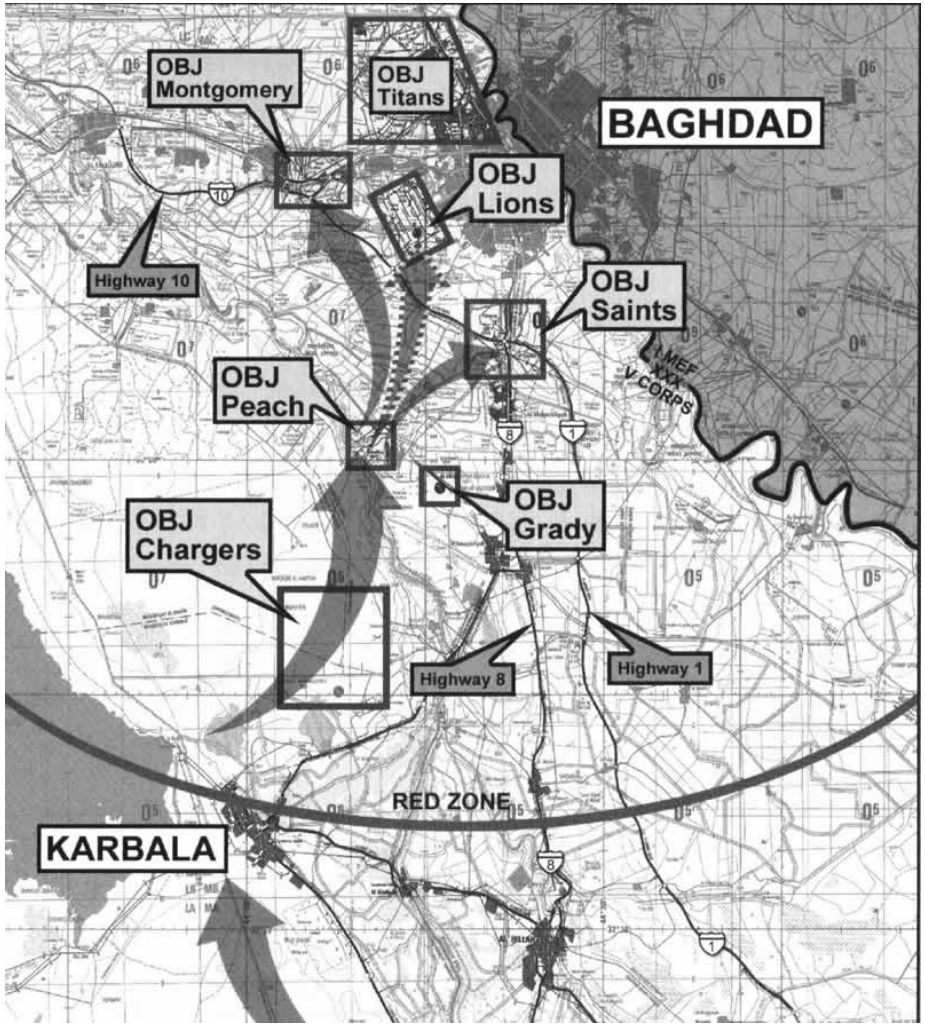
Office of Force Transformation



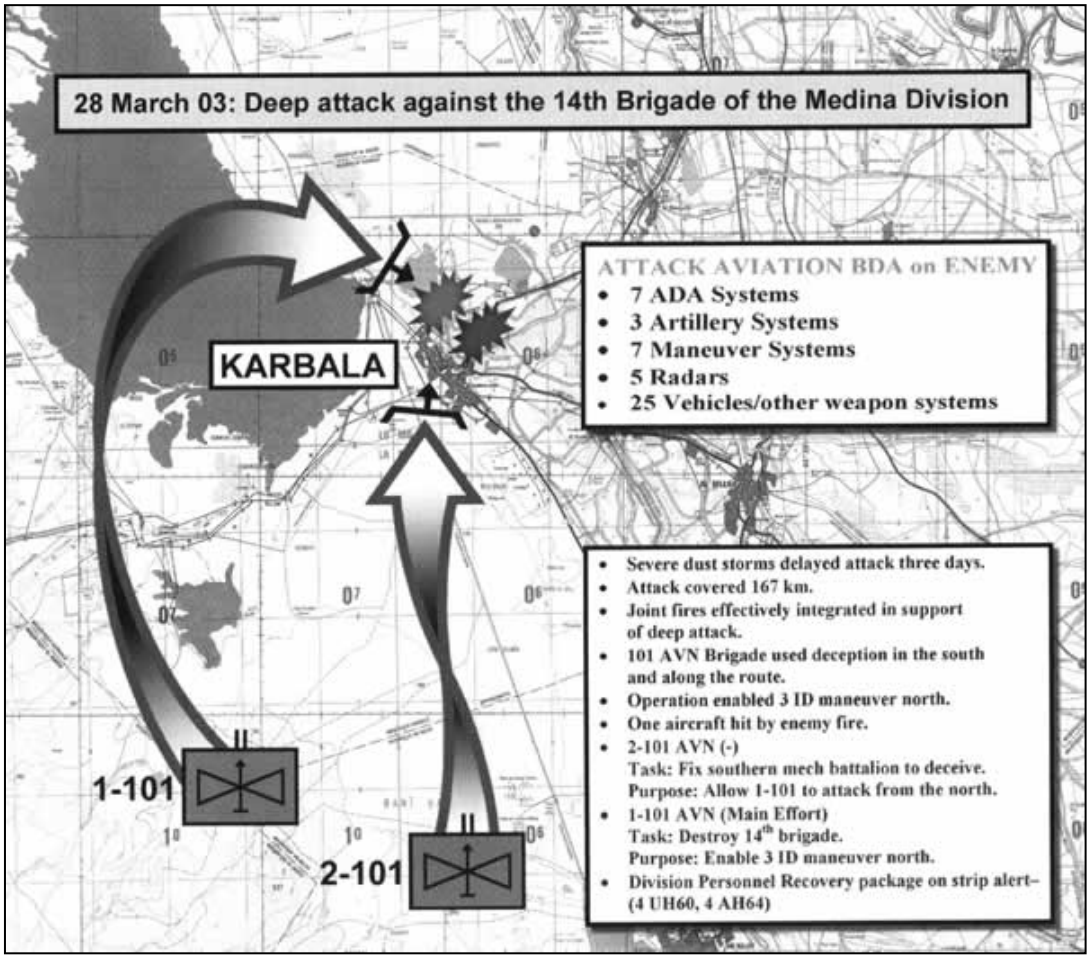
Impact of Increased Situational Awareness on Command and Control at the Division Level

Major General Blount, Commander, 3rd Infantry Division

V Corps Maneuver Objectives: Karbala to Baghdad



Deep Attack Against Iraqi Forces at Karbala
28 March 2003 (D+9)



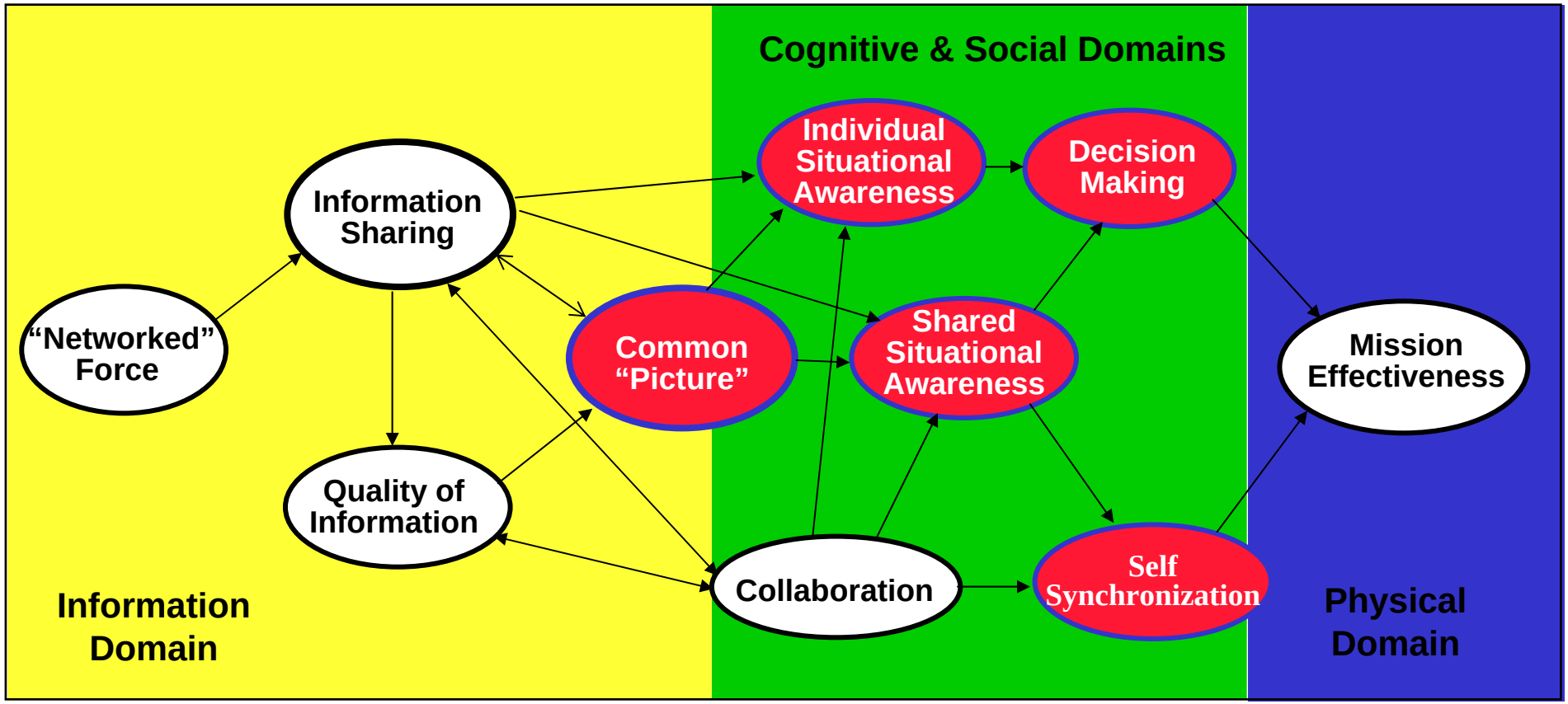
101st Airborne – Deep Attack Against 14th Brigade of Medina Division

Deep Attack Against Iraqi Forces at Karbala
28 March 2003 (D+9)

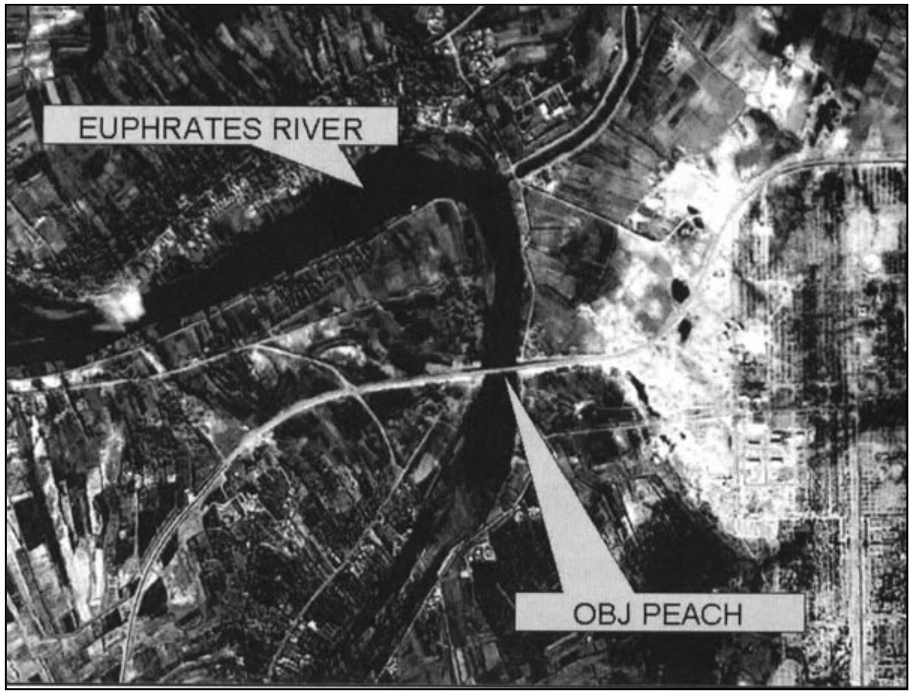
FBCB2/BFT Common Operational Picture enables integration of Joint Fires During Deep Attack at Karbala

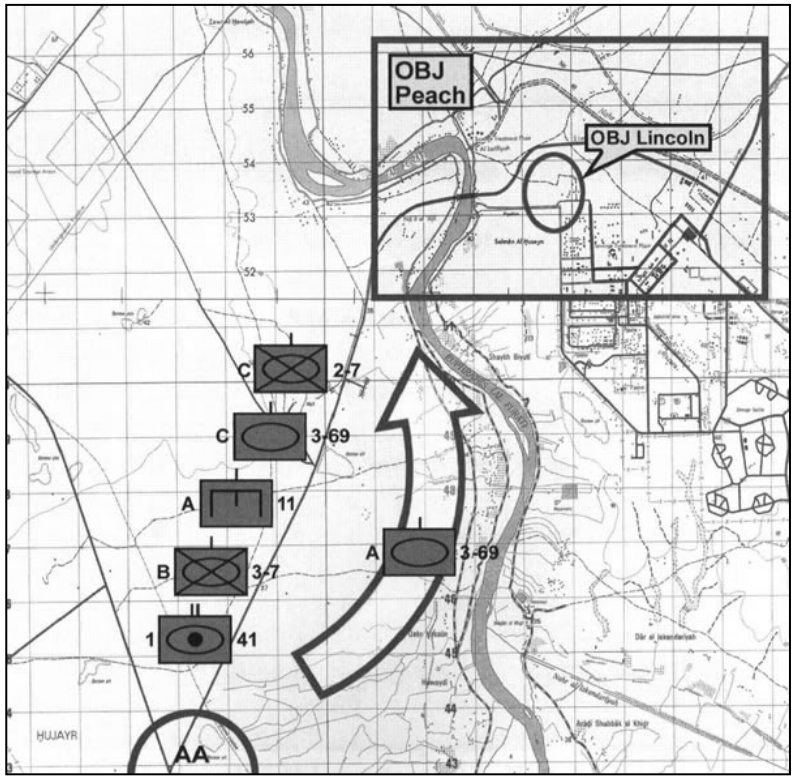
Ground Maneuver during Operation Iraqi Freedom: Key NCW Relationships

Office of Force Transformation



Seizing Objective PEACH: Bridge across the Euphrates River





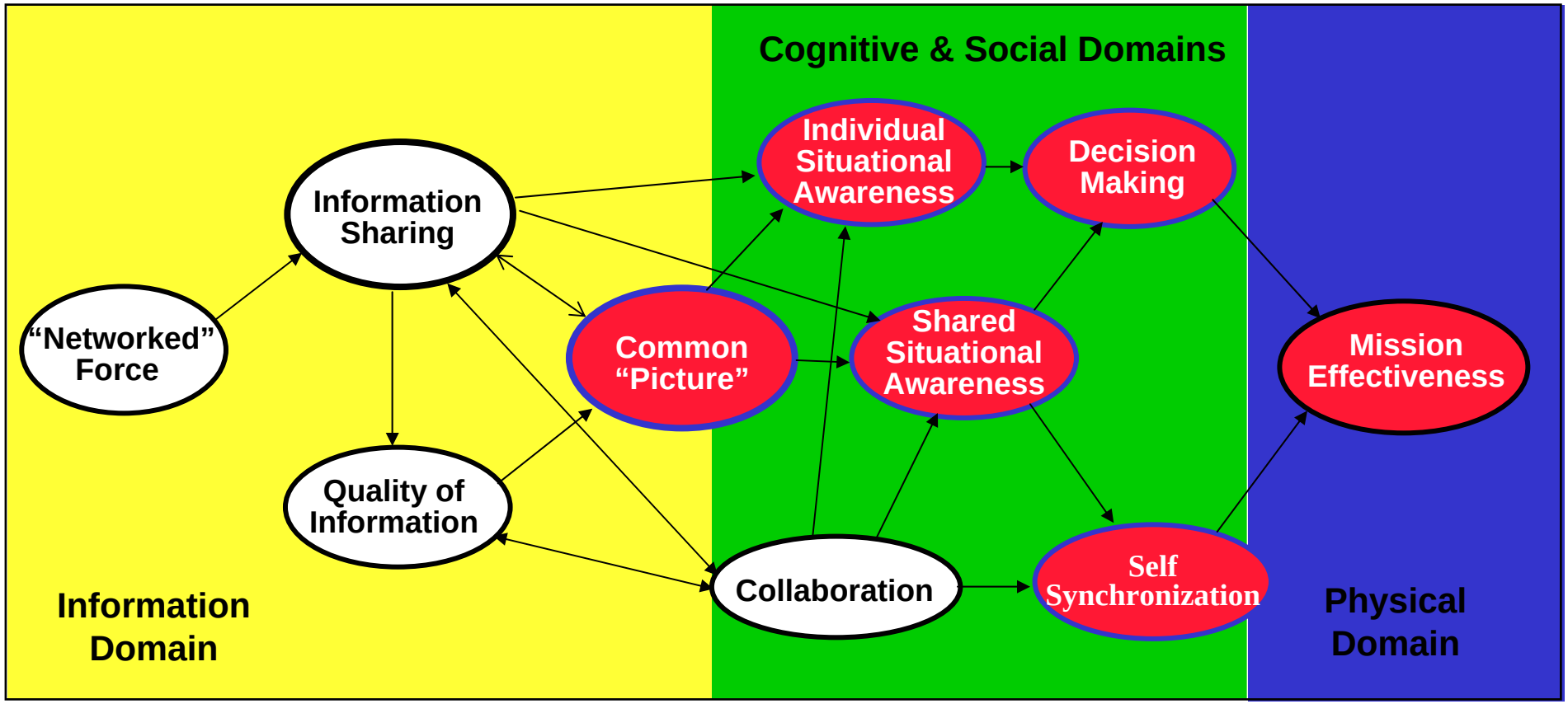
Self-Synchronization: Seizing Objective PEACH

2 April 2003 (D + 14)

LTC Marcone – Commander 3/69 Armor – 1st BCT, 3rd ID

Ground Maneuver during Operation Iraqi Freedom: Key NCW Relationships

Office of Force Transformation



Increased Mission Effectiveness: Reduced Fratricide

"I'm the lead company of the lead TF of the lead Brigade…There was nobody to my front.. I was able to look at my screen and see where friendly units were to my left, right, and to my rear. I was able to pass that information immediately down to my platoons so fratricide was basically eliminated"

- CPT Stewart James, Commander, A-2/69 AR, 3rd BCT, 3ID

"The whole squadron was in column on a highway. FBCB2/BFT displayed the locations of all blue forces. I knew the location of observed red, and was able to call for fire based on FBCB2/BFT knowledge"

- CPT, Commander, A Troop 3/7 Cavalry Regiment, 3rd Infantry Division

"Our counter battery radar picked up rounds through the Marine sector. Prior firing counter battery, the Fire Officer checked the BFT screen and ascertained that a 3ID unit (Army) had crossed over into the Marine sector and was firing at the enemy. Had it not been for BFT (FBCB2), we probably would have fired upon a friendly 3ID unit"

- LTC, USMC Division Forward Senior Watchkeeper

Increased Mission Effectiveness: Achieving Surprise

2nd Royal Tank Regiment – 1st (UK) Armd Div, used a combination of the satellite imagery and the positioning capability of FBCB2/BFT to identify targets for urban raids. During operations in Az Zubayr and Basrah, information was provided on likely insurgent operating bases. These were, generally, houses in urban neighborhoods. Using FBCB2/BFT these locations could be pinpointed and could be reached rapidly using FBCB2/BFT for navigation. This enabled 2nd Royal Tank Regiment to achieve surprise and also minimized the impact of collateral damage through misinterpreting information.

Source: NCO Case Study on US/UK Coalition Operations during Operation Iraqi Freedom

Getting the Theory Right: Command and Control of a Networked Force

What's Different?

- **"Common" Operational Picture**
  - **Reduced "Fog" of War**
- **Shared Situational Awareness (SA)**
  - **Significantly increased SA for :**
    - Commander
    - Subordinate Commanders
    - Individual Warfighters
  - **Decreased "cognitive loading" in developing SA**
- **Command Intent**
  - **Increased shared situational understanding**
  - **Enhanced by capabilities for real-time collaboration**
- **Enhanced Decision Making**
  - **Speed + Better Decisions**
- **Increased Tactical Agility**
- **Reduced Risk**

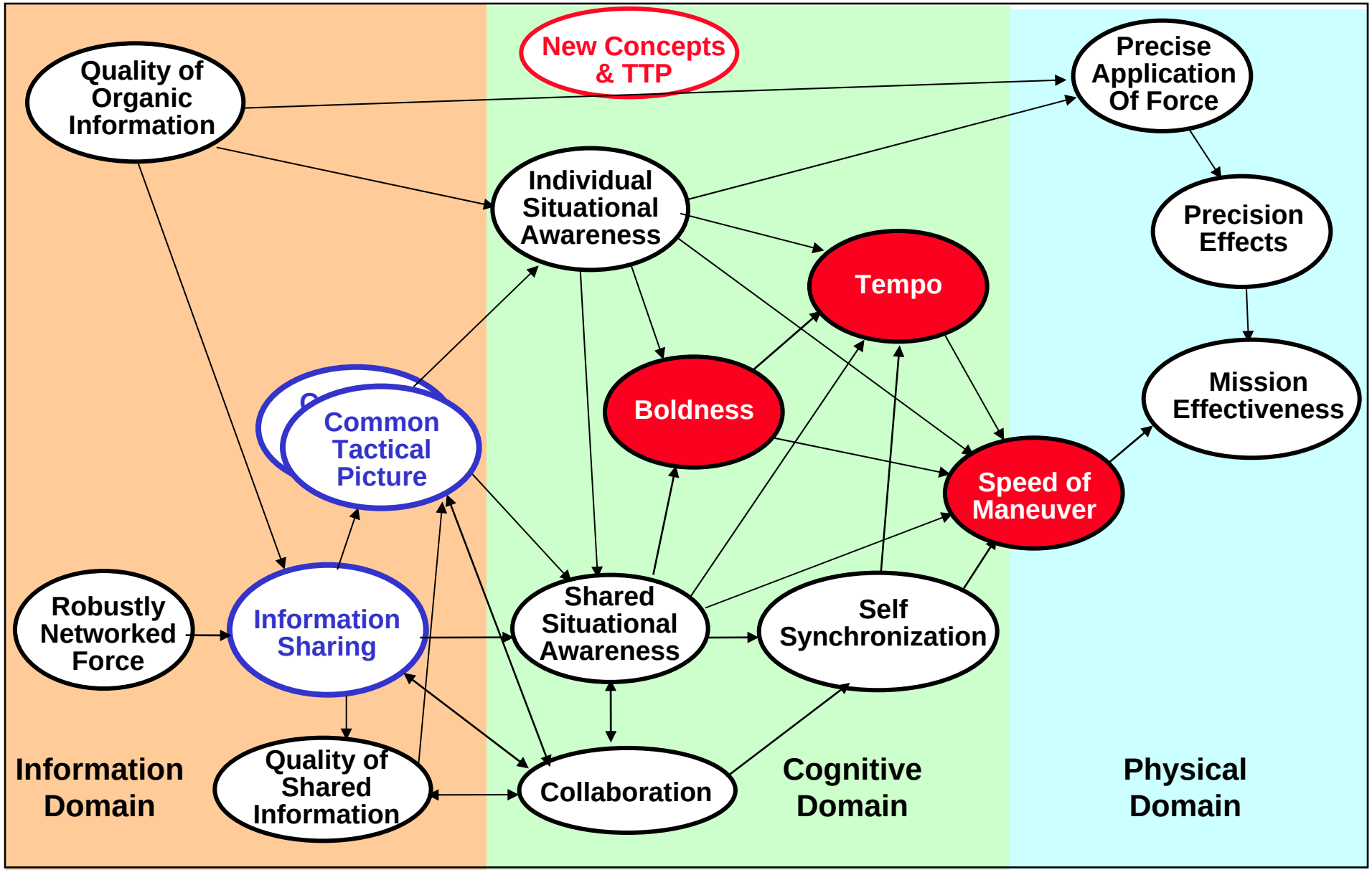
Enhanced Decision Making: "Decision Superiority"

"What I will tell you is that the technology advances in our military today, compared to my experiences in Desert Storm, allowed me to talk via tactical satellite communications and other means across a battle space of hundreds of miles; to be able to conduct, when we need to, video teleconferences, where commanders can plot out where they're and what decisions they need to do next; and put all that together in a joint construct, where I could see where all the airframes were, where all the ships were, where my counterparts in air and maritime components can see where the ground formations are.

When you put all that together, that allowed us to make decisions with situational awareness of where we were at, where the enemy was, and our view of the terrain and the weather much, much faster than we ever could in the past and exponentially faster than our opponent could. So when you put that all together, it allowed us to make decisions and execute those decisions faster than any opponent."

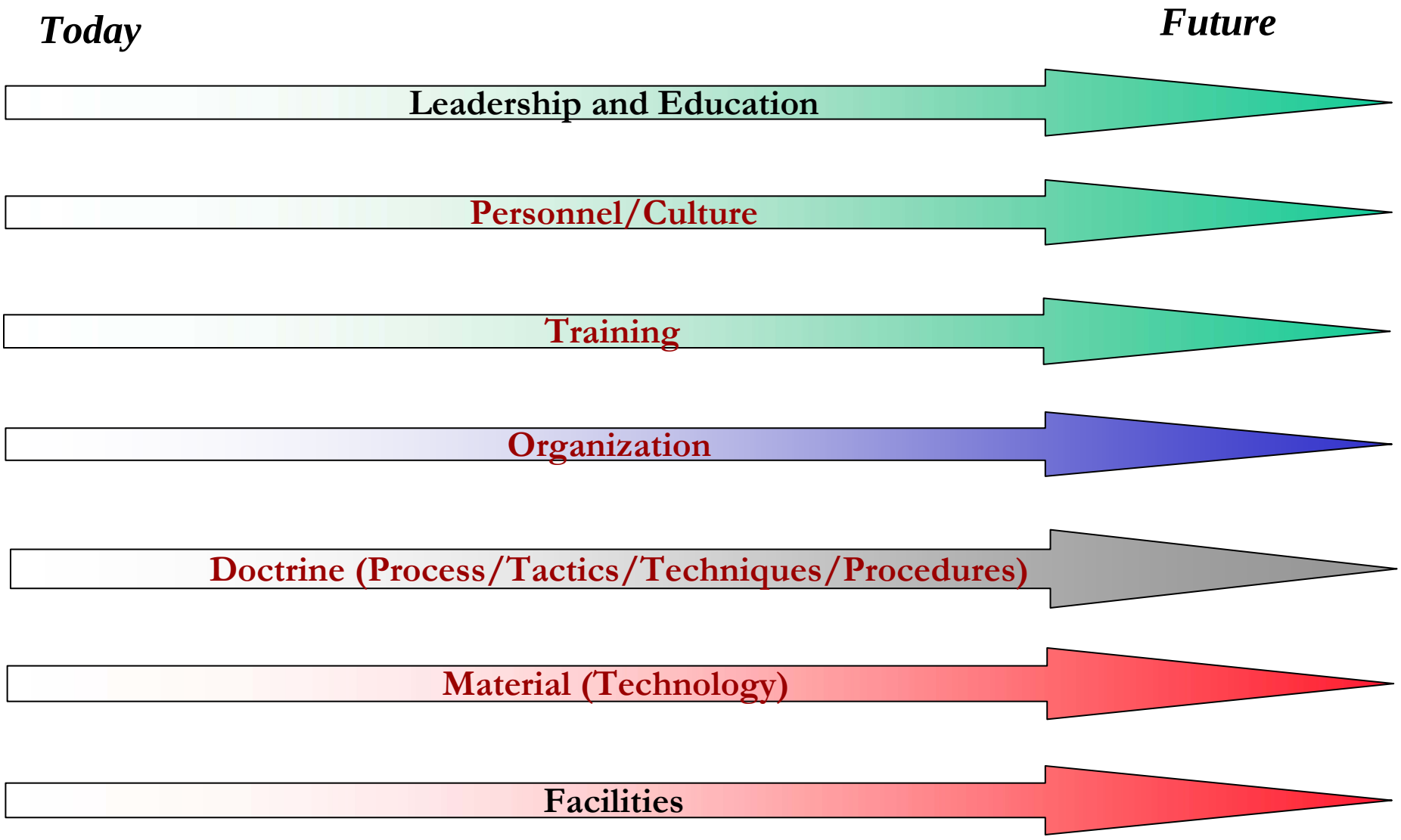
Lt. Gen. David D. McKiernan
Coalition Forces Land Component
Commander, OIF
23 April 03

Network Centric Warfare: Key Relationships



NCO Transformation: The Key Elements

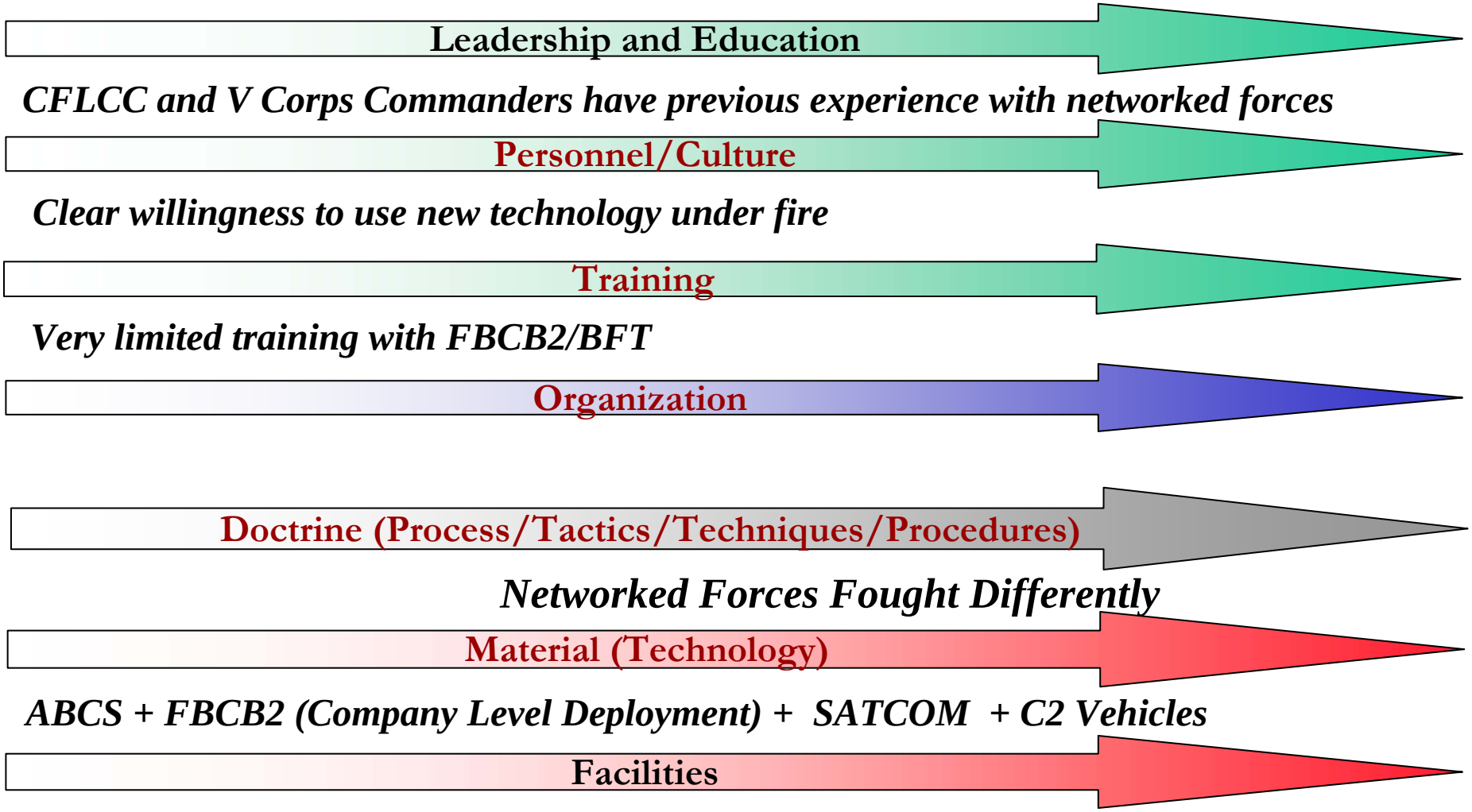
Office of Force Transformation



NCO Transformation: OIF Ground Forces

Office of Force Transformation

2002 2003



Transformation to Network Centric Operations: Insights and Challenges

- Transformation to network centric operations involves all “lines of development”
- Technology
  - Information Technology (IT) is critical enabler
  - Clear benefit to focused IT investments
- Doctrinal (Process) and Organization
  - Changes in these areas are to key achieving mature capabilities for network-centric operations
- Leadership
  - To achieve their full potential, networked forces must be led by leaders who understand how networked forces can operate
  - Education and training are key to developing this understanding
  - Operational experience can accelerate individual and organizational learning

Conclusion

- **Network Centric Operations (NCO)**
  - **Military response to the Information Age**
    - **Exploits new source of power – information sharing**
  - **Key tenets and concepts increasingly well understood**
  - **Maturing body of evidence exists**
    - **Key NCW capabilities demonstrated during OEF/OIF**
- **NCO Transformation**
  - **Involves all lines of development**

Questions?

The Joint Staff C4 Systems Directorate

Implementing the Joint Battle Management Command & Control Roadmap Panel

Colonel Rob Gearhart, USMC
Joint Staff J6I, Integration & Information Assurance Division


Worth1000.com

Interoperability & JBMC2

The JS J6 C4 Systems Directorate Assists US Joint Forces Command in executing MID-912 Responsibilities for Overseeing and Directing JBMC2 Capabilities for Joint Integration and Interoperability by:

- Educating Sponsors
- Engaging Program Managers
- Enforcing Joint Interoperability Requirements

Interoperability Certification Criteria

- Joint Capabilities Integration & Development System (JCIDS) Documents Staffed by J-8 for Comment/Review and Certified for Interoperability by J-6
- CJCSI 3170.01D, CJCSM 3170.01A, and CJCSI 6212.01C Format and Criteria
  - Includes Net Ready – Key Performance Parameter
    - Adherence to Net Centric Operations & Warfare Reference Model (NCOW-RM)
    - Required Integrated Architecture Products
    - Adherence to the Global Information Grid (GIG) architecture through Key Interface Profiles (KIPs)
    - Information Assurance
  - System Registration JCPAT-E and DOD IT Registry (FISMA)
  - IT Standards Conformance Profile (DISRonline)
  - J-6 Interoperability Certification Memorandum Provided to Document Sponsor via the JCIDS Process

Interoperability & JBMC2

The Net Ready Key Performance Parameter (NR-KPP) defines current J6 Interoperability Requirements

- The NR-KPP will assure seamless operation of the Global Information Grid (GIG)
- The NR-KPP is the Key to Achieving Interoperability in a Net Centric Environment

J6 Interoperability Certification Achieved Through:

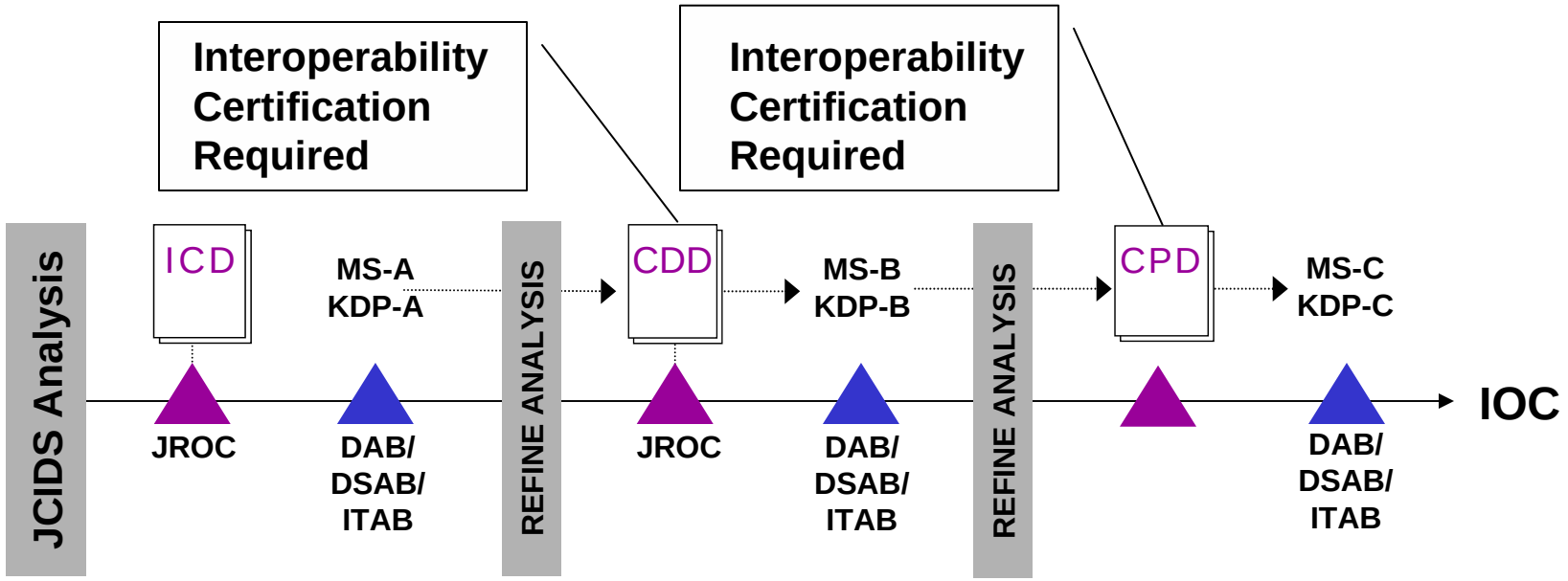
1. Joint Capabilities Integration & Development System (JCIDS) Reviews
2. CJCSI 6212.01C Interoperability and Supportability of Information Technology and National Security Systems
3. Joint Interoperability Test Command (JITC) and the Interoperability Test Panel (ITP)

There are approximately 236 Initiatives within the JBMC2 Roadmap

Interoperability and JCIDS

- No Milestone C Decisions Have Been Approved Without J6 Certification since the JCIDS Process was Launched in June 2003

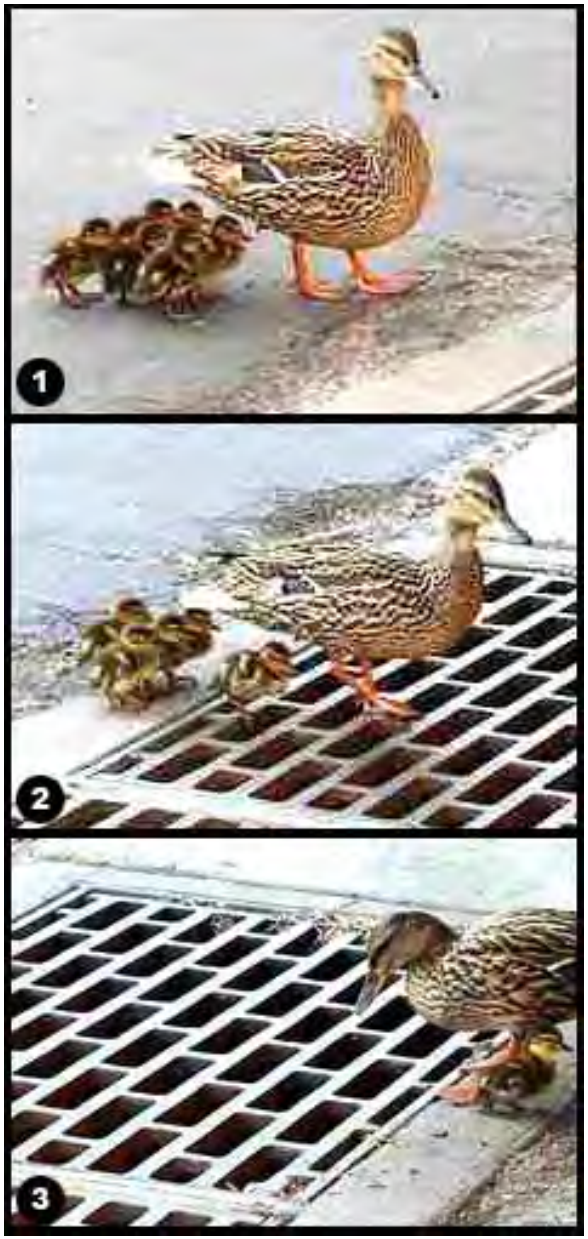
- Interoperability Certification Through JCIDS is Working



Joint Capabilities Integration and Development System (JCIDS)

Current Acquisition Programs = success

Fielded, Post-Acquisition Programs = challenge



Programs prior to Interoperability Requirements

Interoperability Requirements Applied

What is left

Interoperability through CJCSI 6212

- The Challenge – Enforcing current DoD Interoperability Standards for Fielded Systems

- The Joint C4I Program Assessment Tool (JCPAT), System Tracking Program (STP), and DoD Information Technology Registry (DoD IT Registry) databases indicate

  - **236 JBMC2 Roadmap Initiatives**
  - **127 of 236 are not J6 Interoperability Certified**
  - **158 of 236 are not Joint Interoperability Test Command (JITC) Certified**

- Corrective actions and initiatives

  - Enforcement of CJCSI 6212 requirement for tri-annual test recertification by the Joint Interoperability Test Command (JITC)
  - Military Communications & Electronics Board (MCEB) Interoperability Test Panel (ITP) Reviews
  - MCEB and/or Interoperability Senior Review Panel Referral

Interoperability through Testing

Four Basic Steps

Step 1: Identify & Verify Interoperability Requirements

Step 2: Develop Certification Evaluation Approach

Step 3: Collect & Analyze Interoperability Data

Step 4: Determine the Interoperability Status

Certification Status

Certification Activity	FY 2002	FY 2003	FY 2004	FY 2005
JITC Interoperability Test Certifications	99	91	73	36*
JITC Interoperability Assessments	0	8	32	12*
JITC Conformance Certifications	59	82	76	28*
MCEB ITP ICTOs Granted	32	43	77	37*

* As of 16 Mar 05

Interoperability & JBMC2

The Goal - Full J6 Interoperability & JITC Test Certification, Including the Net Ready Key Performance Parameter, of the Initiatives that Comprise JBMC2 with Documentation in JCPAT and the DoD IT Registry.

STREET LEGAL

J6 Can Help You Through the Interoperability Requirements Maze

Joint Staff J6 POCs

- Enforcement & Testing Branch (J6I)

  LTC(P) Brian Hamilton, USA

  703-614-7784 / brian.hamilton@js.pentagon.mil

- JCIDS Branch (J6I)

  CDR Charles C. Moore II, USN

  703-697-4232 / charles.moore@js.pentagon.mil

- Net Readiness Assessments Branch (J6I)

  Mr. Tom Gaetjen

  703-614-7815 / james.gaetjen@js.pentagon.mil

Data Strategy BACK-UP

BACK UP SLIDES

Interoperability through Data Strategy

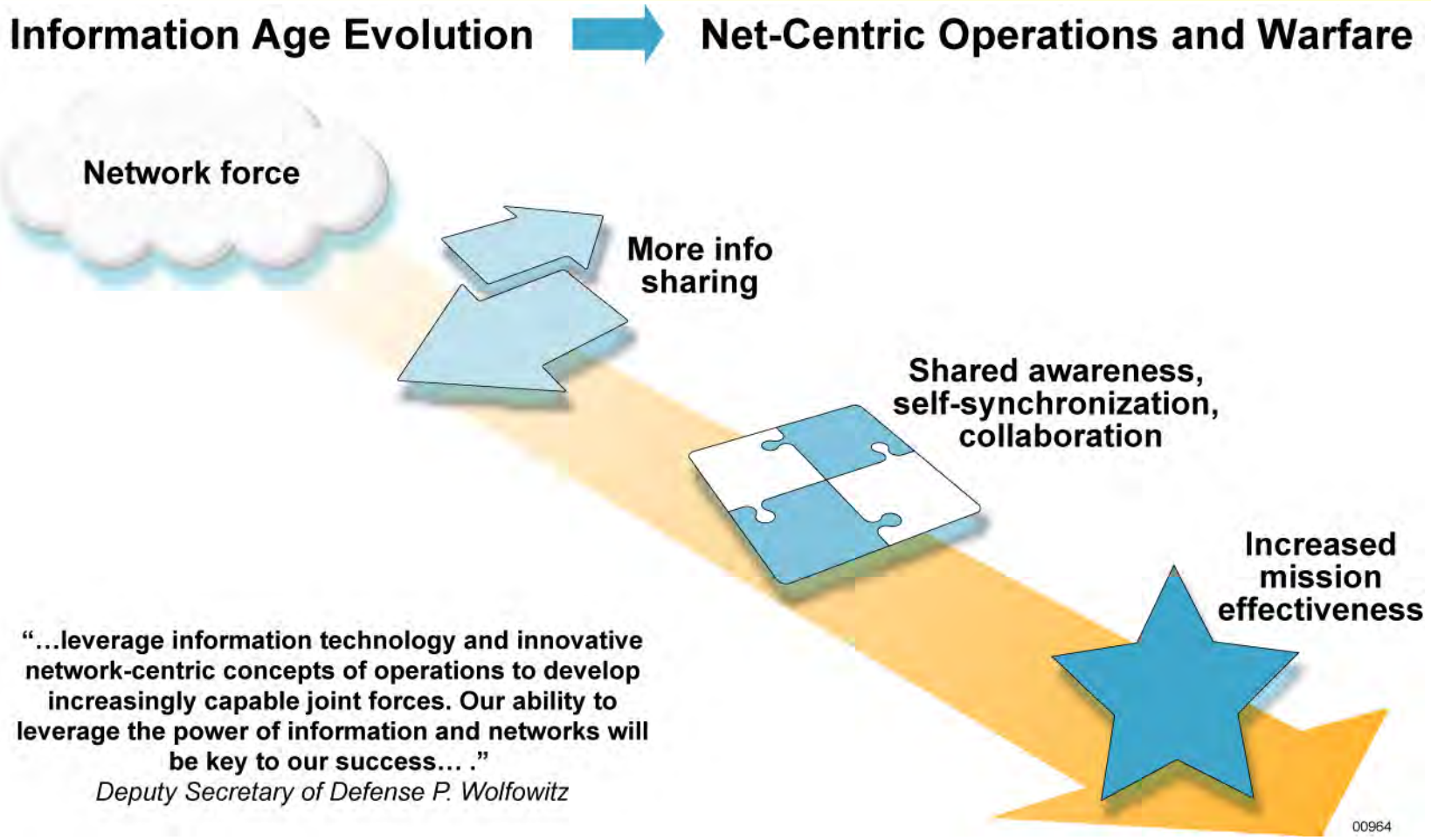
- Guidance on Net-Centric Data Strategy:
  - DOD Net-Centric Data Strategy (9 May 2003).
  - DODD 8320.2 *Data Sharing in a Net-Centric Department of Defense* (2 Dec 2004).
  - Net-Centric Operations and Warfare Reference Model (NCOW-RM) v1.1.
- Inclusion of Data Strategy implementation in CJSCI 6212.01D (Draft).
- J6 will assess data strategy implementation as part of NR-KPP.
- Involvement of Warfighting Mission Area Managers and Domain Managers in Community of Interest (COI) oversight.

The Global Information Grid:

Enabling the Transformation to Net-Centric Operations

March 2005

DoD Transformation Vision



"…leverage information technology and innovative network-centric concepts of operations to develop increasingly capable joint forces. Our ability to leverage the power of information and networks will be key to our success… ."
Deputy Secretary of Defense P. Wolfowitz

Power to the Edge!

People throughout the trusted, dependable and ubiquitous network are empowered by their ability to access information and recognized for the inputs they provide.

Three goals:

- ***Build the net***
- ***Populate it***
- ***Protect it***

Everyone and everything is on the net!

The *New* Priority Lessons from Iraq

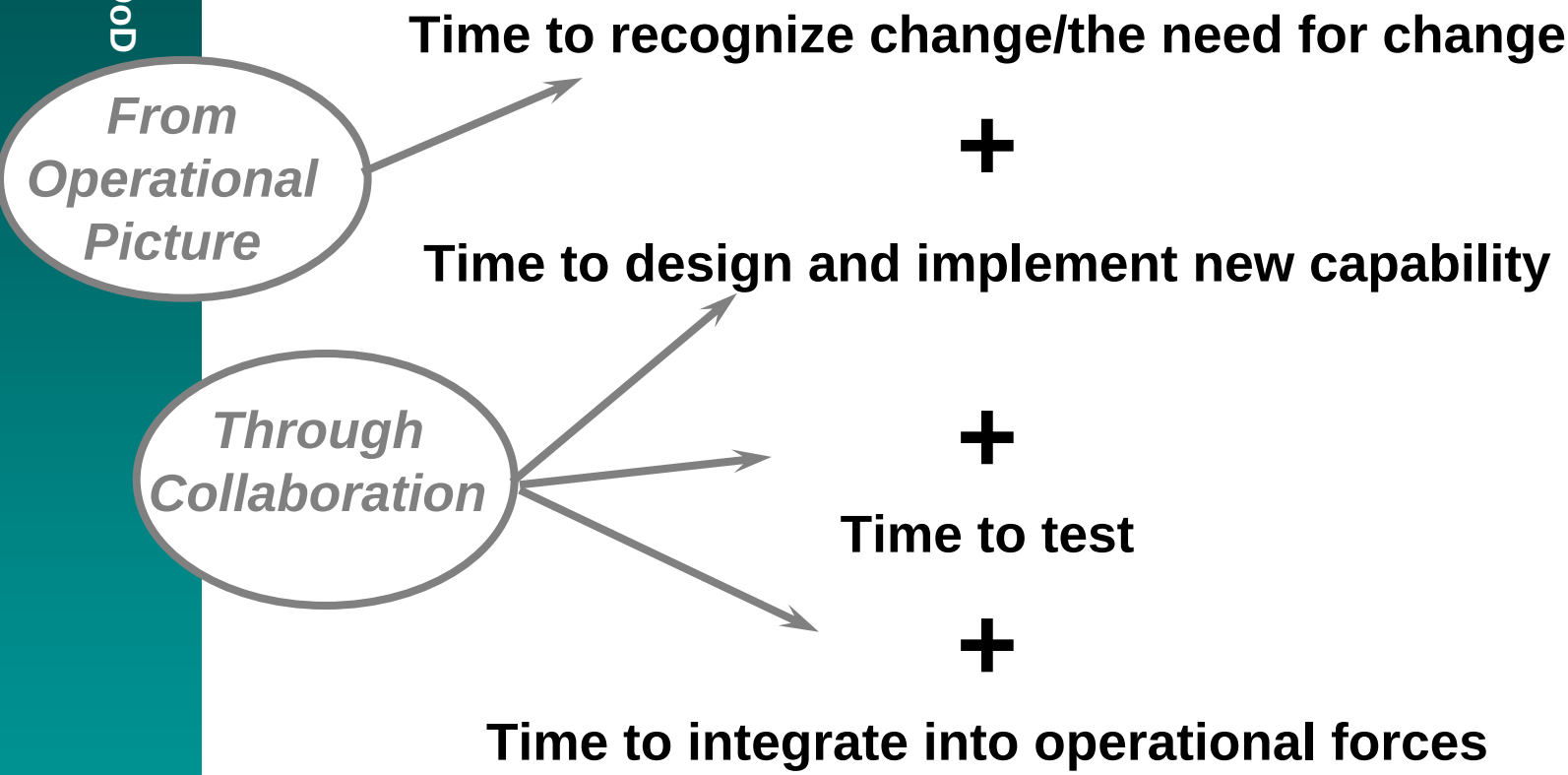
Information Age forces must rapidly

- **Recombine/reconfigure organizations**
- **Change organizational behavior**

. . . *Faster* than our enemies

Bottom Line: agility . . . Agility . . . AGILITY!

Agility MOEs - the *New* Metrics



Net-Centricity Affords Key Benefits

Better use and protection of resources	**Faster, superior decision cycles and shared awareness**
	Effective force multiplication through higher quality information
More effective use of information assets	**Improved "command and control"**
	Immediate awareness of information availability
	Near-real time availability of intelligence
More efficient use of platforms	**Better "pictures" of the operating environment**
	Better visibility into asset status
	Higher yield to warfighters based on transformed business processes

When the Vision Is Achieved….
What's In? What's Out? with Net-Centricity

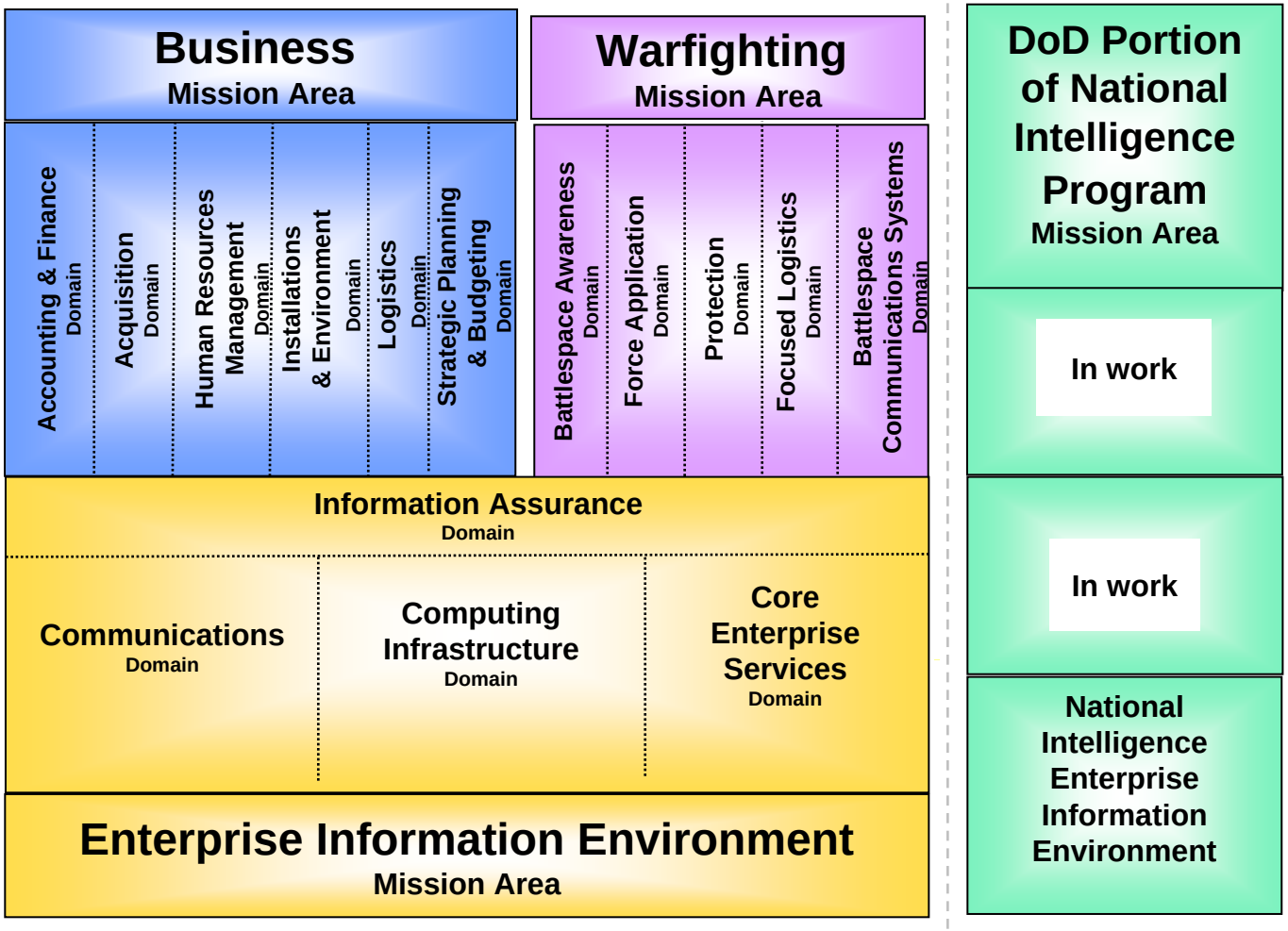
IN

- User-Defined Operating Picture
- Self-synchronizing ops
- Information pull
- Collaboration
- Communities of Interest
- Task, post, process, use
- Only handle information once
- Shared data
- Persistent, continuous IA
- Bandwidth on demand
- IP-based Satcom
- Diverse routing
- Enterprise services
- COTS based, net-centric capabilities

OUT

- Situational awareness (COP)
- Autonomous ops
- Broadcast information push
- Individual
- Stovepipes
- Task, process, exploit, disseminate
- Multiple data calls, data duplication
- Private data
- Perimeter, one-time security
- Bandwidth limitations
- Circuit-based Satcom
- Single points of failure
- Separate infrastructures
- Customized, platform centric IT

GIG Portfolios



Challenges

- Resourcing and **completing the communications backbone** – the critical enabler:
  - **TSAT** – from the terrestrial (GIG-BE) to mobile environments
  - **JTRS** – the mobile communications backbone
- Defining, resourcing and implementing the **GIAP – GIG IA Portfolio** – to secure the networks, data and therefore our resources and people
- **Quality of Service** – operating at or above required service levels – for headquarters and mobile, disadvantaged users
- **NetOps** – understanding the environment and delivering trustworthy service to all users, anytime and anyplace
- Implementing the **data strategy** – so that required data is visible, accessible and understandable – even by unanticipated users

What Does Net-Centricity Mean for our Industry Partners?

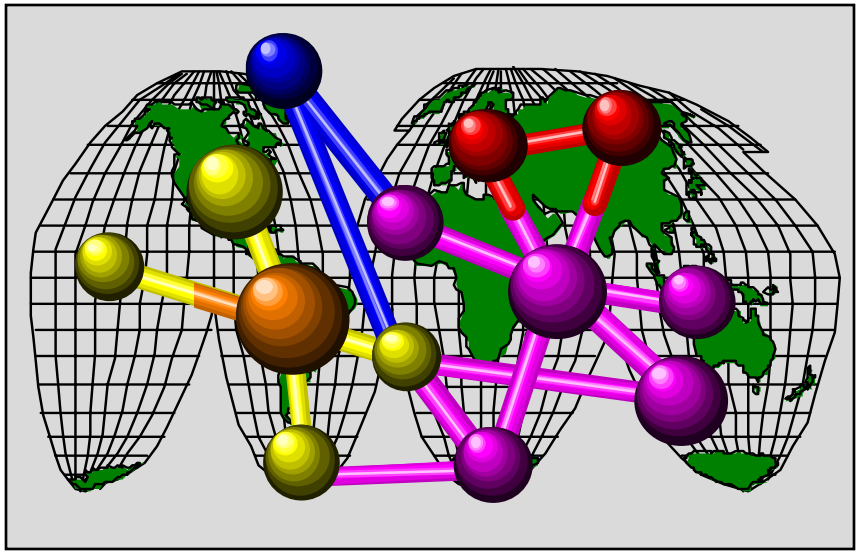
- Faster application implementation
  - Increased use of COTS
  - Fewer dollars for application integration
- Robust, highly engineered Enterprise Information Environment (EIE)
  - Significant engineering effort – end-to-end QoS
  - Requires standards in many areas – lots of work here
  - Service Oriented Architecture – expect to use managed services – new business models
- Ability to access needed data – anytime, anyplace
  - Focus on data – data separate from applications
  - Less dependency on contractors and/or software to “find” or translate information
- Collaboration
  - More collaboration – internally and externally

What Does Net-Centricity Mean for our Industry Partners?
(continued)

- **Shortened timelines between recognizing the need for change and integrating a new capability into the operational force (agility)**
  - More focus on process improvement
  - IT isn't the long-pole on organizational change/implementing new capabilities

DoD Enterprise Architecture

NDIA Net-centric Operations Conference
March 2003



Department of Defense

Terry Hagle, Office of DoD CIO/A&I

607-0235

terry.hagle@osd.mil

DoD Enterprise Architecture

- What is it?
- Who is responsible for its description, development, etc?
- What is its composition?
- What does compliance mean?

DoD Enterprise Architecture

Architecture

The structure of components, their relationships, and the principles and guidelines governing their design and evolution over time

DoD Architecture Framework, V 1.0
Based on IEEE STD 610.12, 1990

- ***components***
- ***relationships***

Describing an Architecture

Components and Relationships

The DoDAF defines three views of an architecture description:

- **Operational View**
- **Systems View**
- **Technical Standards View**

Views, composed of sets of architectural data elements, define the components and relationships

Core Architecture Data Model (CADM) defines the entities and relationships for architecture data

OMB/GAO: *Enterprise* Architecture

What is an Enterprise Architecture?

Scoping function:
Components and Relationships are enterprise in scope

An EA is the explicit description and documentation of the current and desired relationships among business and management processes and information technology. It describes the "current architecture" and "target architecture" to include the rules and standards and systems life cycle information to optimize and maintain the environment which the agency wishes to create and maintain by managing its IT portfolio. The EA must also provide a strategy that will enable the agency to support its current state and act as the roadmap for transition to its target environment.

Source: OMB Circular A-130, Revised (Transmittal Memorandum No. 4), 8 December 2003, Section 8, Policy, paragraph b, (2), (a) (page 15 0f 23)

- Current Architecture (AS-IS)
- Target Architecture (TO-BE)
- Transition Strategy

Global Information Grid Architecture

DoD's Enterprise Architecture

Information Technology Architecture for the Executive Agency

DoD CIO

"Develop, maintain, and facilitate the implementation of a sound and integrated information technology architecturefor the executive agency"

(40 U.S.C. Section 1425)

- AS-IS Architecture -- Version 1.0
- TO-BE Architecture -- Version 2.0
- Transition Strategy -- NCOW Reference Model

Target Audience: Capability Developers & Program Managers' Technical Staff

- 'What' not 'How'
  - Not an implementation strategy
- 20xx timeframe
- Not an Architecture

- Language/taxonomy
- Net-centric Enterprise Services Strategy
- Net-centric Data Strategy
- Net-centric Information Assurance Strategy

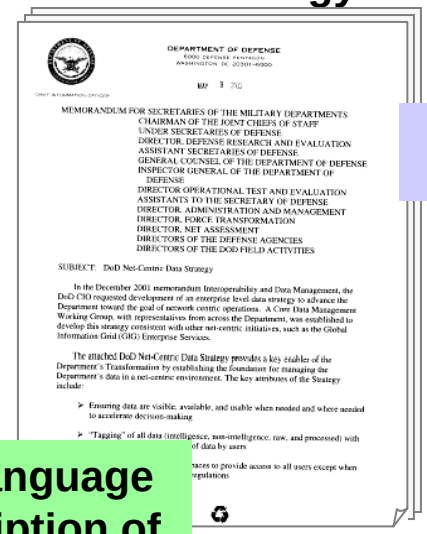
Why Build a Reference Model?

- ✓ **Integrated Net-centric strategies – Define the target architectural environment**
- ✓ **Provide Program Managers acquisition guidance on what to make contractually binding beyond the *Joint Technical Arch (JTA).***
  - **Provide immediate utility without time-consuming analysis of the DoD Enterprise Architecture (GIG Architecture Versions 1 and 2)**
  - **Overcome difficulty of relating and applying a broad Enterprise Architecture to specific programs.**
- ✓ **Provide a common net-centric architectural construct congruent with the DoDAF.**
- ✓ **Establish a common language and taxonomy for NCOW concepts.**
- ✓ **Demonstrate and promote the TPPU Vision.**
- ✓ **Focus the GIG Arch compliance requirement**
- ✓ **DoD mapping to Federal Enterprise Architecture**
- ✓ **Support evolution of the *DoD Architecture Framework* and the DoD IT Standards Registry (DISR) – previously known as the JTA**

Building the Model is a collective DoD effort

NCOW REFERENCE MODEL VERSION 1.1
INCORPORATING NET-CENTRIC DATA STRATEGY

DoD Net-Centric Data Strategy



DEPARTMENT OF DEFENSE
1000 DEFENSE PENTAGON
WASHINGTON, DC 20301-1000

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
DIRECTOR, DEFENSE RESEARCH AND EVALUATION
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
DIRECTOR OPERATIONAL TEST AND EVALUATION
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTOR, FORCE TRANSFORMATION
DIRECTOR, NET ASSESSMENT
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: DoD Net-Centric Data Strategy

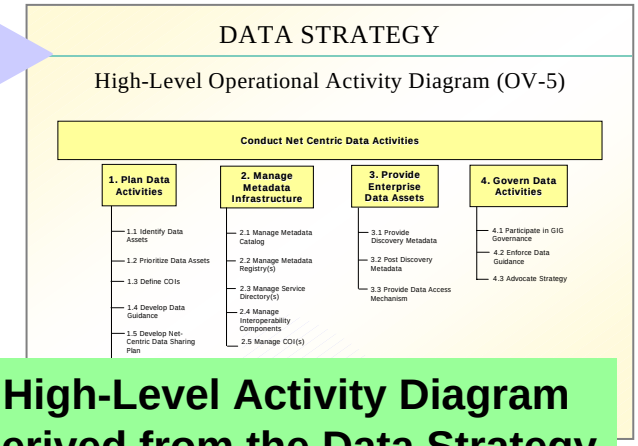
In the December 2001 memorandum Interoperability and Data Management, the DoD CIO requested development of an enterprise level data strategy to advance the Department toward the goal of network centric operations. A Core Data Management Working Group, with representatives from across the Department, was established to develop this strategy consistent with other net-centric initiatives, such as the Global Information Grid (GIG) Enterprise Services.

The attached DoD Net-Centric Data Strategy provides a key enabler of the Department's Transformation by establishing the foundation for managing the Department's data in a net-centric environment. The key attributes of the Strategy include:

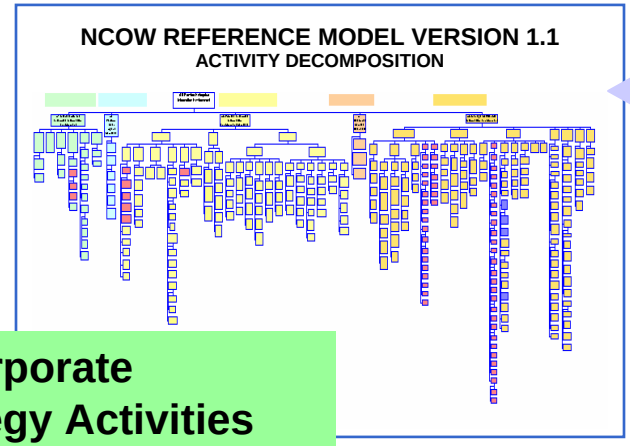
- Ensuring data are visible, available, and usable when needed and where needed to accelerate decision-making
- "Tagging" of all data (intelligence, non-intelligence, raw, and processed) with [illegible] of data by users
- [illegible] to provide access to all users except when [illegible] regulations

English-language text description of the DoD Data Strategy

Data Strategy Working Group Architecture Products



High-Level Activity Diagram derived from the Data Strategy



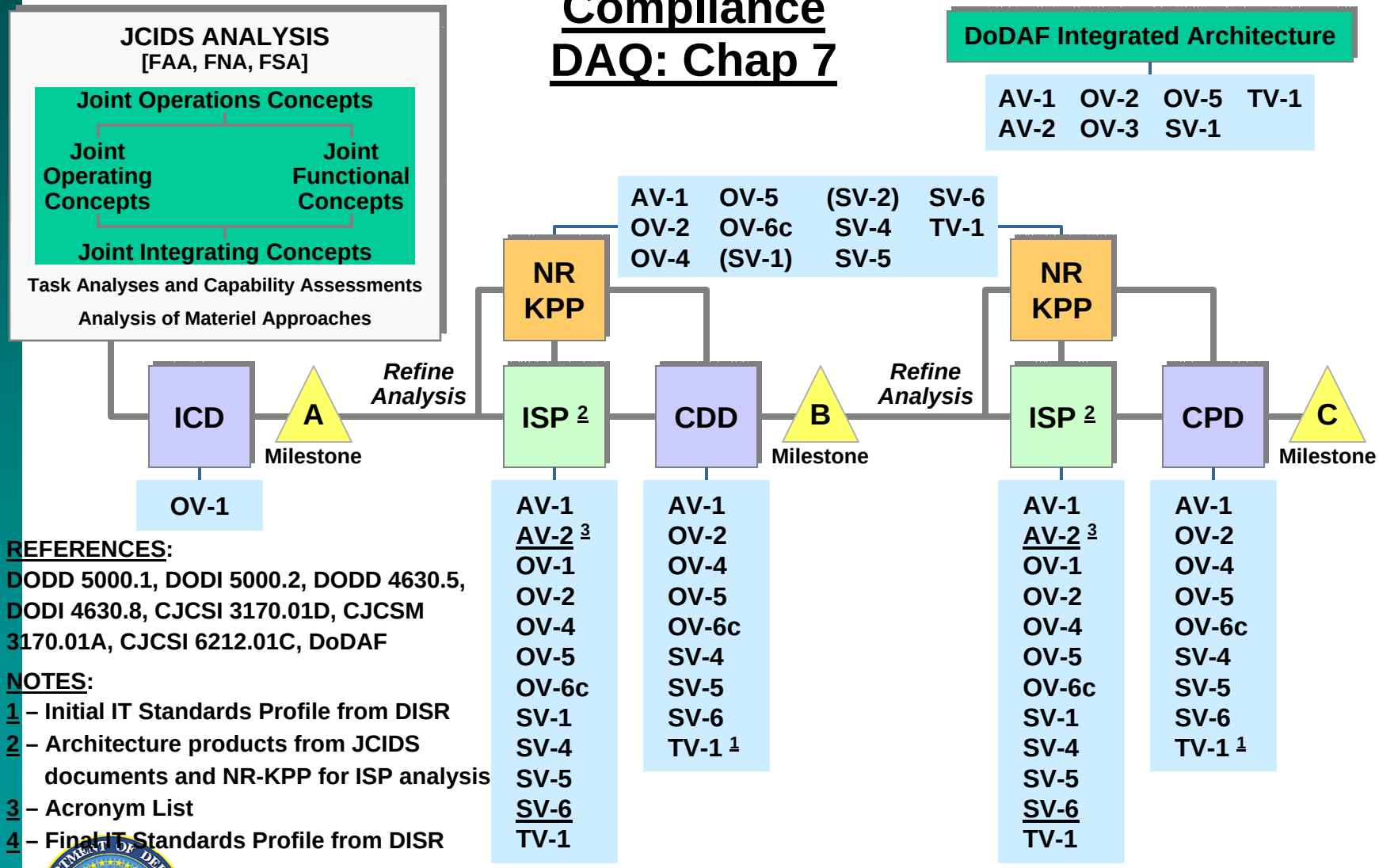
Ncow Reference Model Version 1.1 Activity Decomposition

Incorporate Data Strategy Activities

Power to the Edge

THE GLOBAL INFORMATION GRID
ARCHITECTURES AND DECISION-MAKING PROCESSES

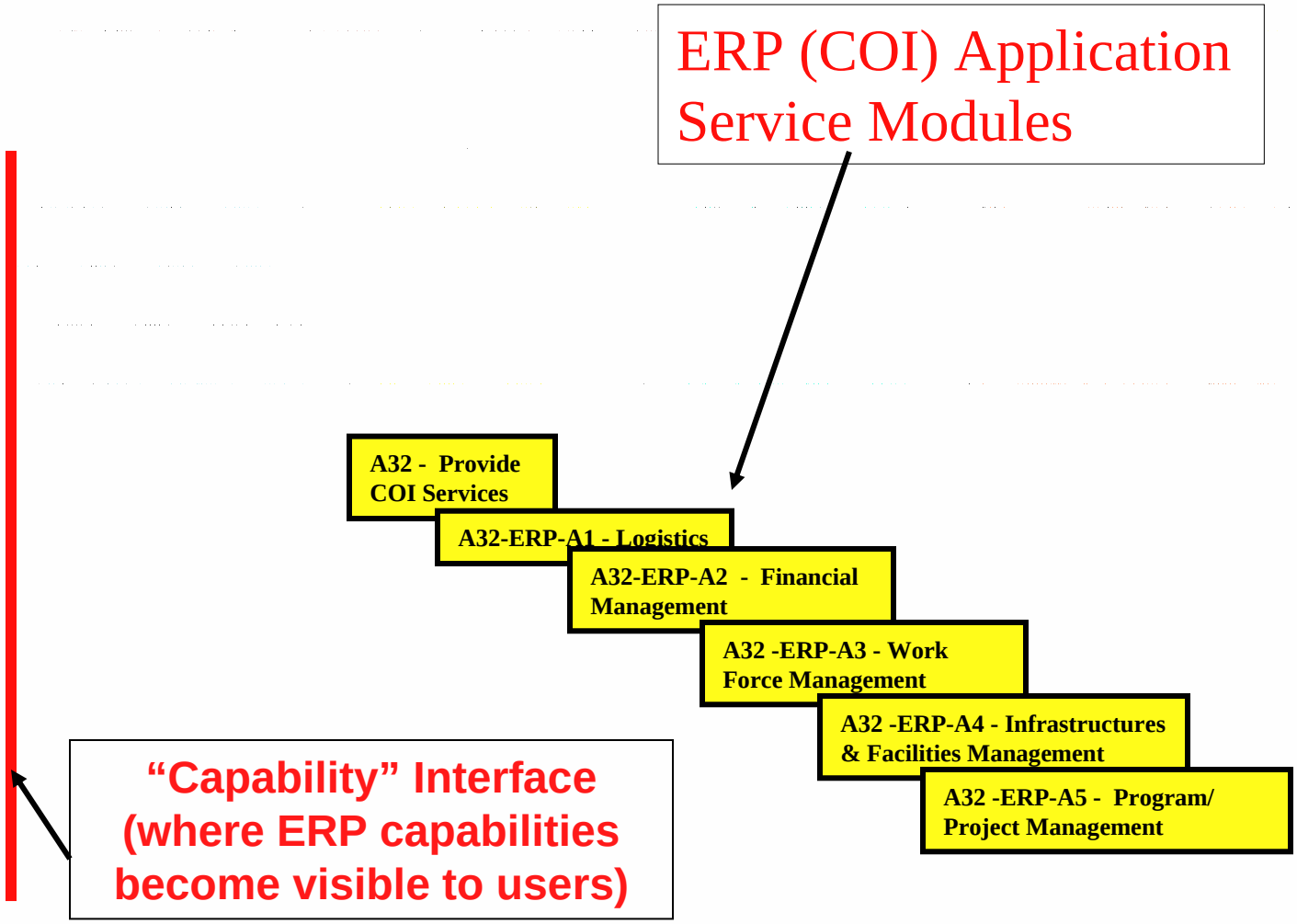
Compliance
DAQ: Chap 7



REFERENCES:
DODD 5000.1, DODI 5000.2, DODD 4630.5, DODI 4630.8, CJCSI 3170.01D, CJCSM 3170.01A, CJCSI 6212.01C, DoDAF

NOTES:
1 – Initial IT Standards Profile from DISR
2 – Architecture products from JCIDS documents and NR-KPP for ISP analysis
3 – Acronym List
4 – Final IT Standards Profile from DISR

No new documentation required


ERP (COI) Application Service Modules
A32 - Provide COI Services
A32-ERP-A1 - Logistics
A32-ERP-A2 - Financial Management
A32 -ERP-A3 - Work Force Management
A32 -ERP-A4 - Infrastructures & Facilities Management
A32 -ERP-A5 - Program/ Project Management
"Capability" Interface (where ERP capabilities become visible to users)

EIEMA Domains

- Core Enterprise Services
- Computing
- Communications
- Information Assurance

Net-centric strategies
Integrated in the NCOW Reference Model

EIEMA Governance Portfolios

- **Portfolio Management (PfM):** A disciplined approach to analyzing, selecting, controlling and evaluating the best mix of investments to strengthen a mission capability.
  - Composed of: Programs of Record and other entities
- Compliance with the DoD Enterprise Architecture
  - Compliance Precursors: DoDAF, CADM, and DISR
  - NCOW Reference Model
  - Net-centric Checklist
  - Adherence to the Net-centric strategies
  - Compliance Framework in development
  - KIPS
  - On-Line Tool
  - Defense Acquisition Guidebook, Chap 7

Questions

Net Centric Operations, Interoperability and Systems Integration Conference

23 March 2005

Jeffrey K. Harris
Corporate Vice President
Situational Awareness
Lockheed Martin

Live Like You Are Dying

Environment

- *Globalization and counter-trends*
- *Non-integrating gap*
- *Broad "arc of instability"*
  - *Failed states / ungoverned areas*
- *Breeding ground / sanctuary for asymmetric threats*

Volatile, turbulent world

Rogues

- ***Nation-states, sub-national groups and individuals***
- ***Disregard international law and violate treaties***
- ***Secretly pursue/proliferate weapons of mass destruction***
- ***Reject peaceful resolution of disputes***
- ***Callously disregard life***

… and all the classic problems….China….Russia…

The Imperative….

"'Transformation' is an interesting word….possibly the single-most transforming thing in our force will not be a weapon system, but a set of interconnections and a substantially enhanced capability because of that awareness."

Sweden's Navy had a (brief) transformation\ mandated by the king in 1625

- ***1625: King Gustav II Adolph commissions the ship* Vasa**
- ***"…The royal mighty battle galleon… greater than any ship ever built at that time. The king himself dictated the Vasa's measurements and no one dared argue against him."***
  - Two gun decks, 64 cannon
  - 190 foot main mast
  - 133 sailors
  - 40 acres of timber in construction
  - Three years in the making

1628: The top-heavy *Vasa* sinks in the harbor on her maiden voyage

Source: Dottie E. Mayol , *The Swedish Ship Vasa's Revival*, http://www.abc.se/~m10354/publ/vasa.htm

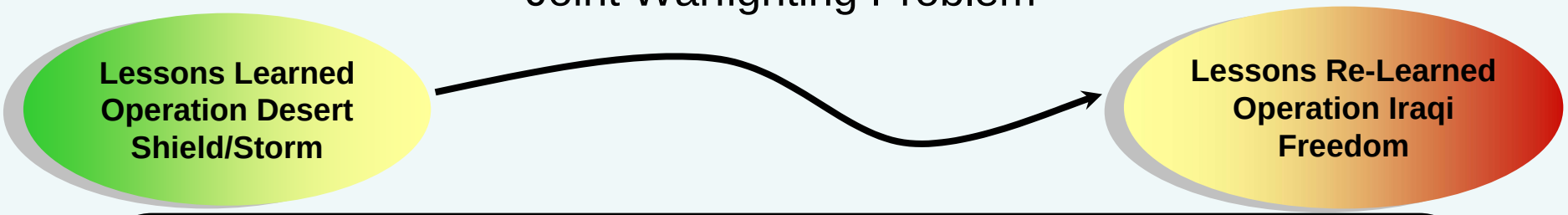
- ***Information Sharing***
- ***Interoperability***
- ***Interdependence***

- ***People***
- ***Process***
  - ***Policy that instantiates “need to share”***
  - ***Risk management instead of avoidance***
  - ***Agility to enable operational solutions***
- ***Technology***
  - ***Knowledge creation***
  - ***Information management***
  - ***Persistent surveillance***

Operationalizing Force Projection in a Netcentric Environment

Col Ed Hatch
USJFCOM J9 JDPO

Joint Warfighting Problem



"Deployment Planning & Execution is Cumbersome - Needs to improve to meet the 21st century operational demands"

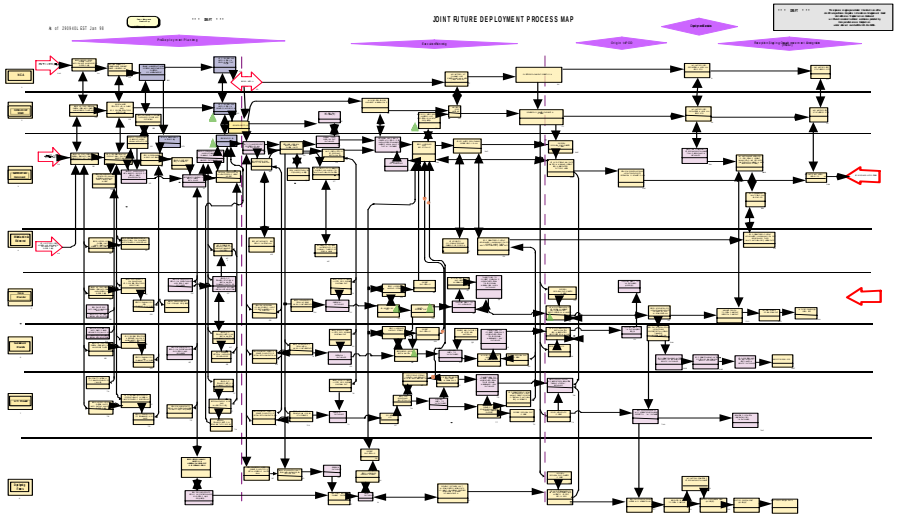
General Tommy R. Franks, USA
Summary of Lessons Learned for the
Senate Armed Services Committee, 9 July 2003

"The current joint deployment planning and execution process was not sufficiently flexible, transparent, user-friendly, or disciplined to accommodate conditions experienced in this contingency…. Consequently, despite vast amounts of energy invested by CENTCOM, TRANSCOM and others, demands for flexibility and adaptation outpaced existing processes."

Joint Lessons Learned
Operation Iraqi Freedom Major Combat Operations
Joint Forces Command. 01 March 2004

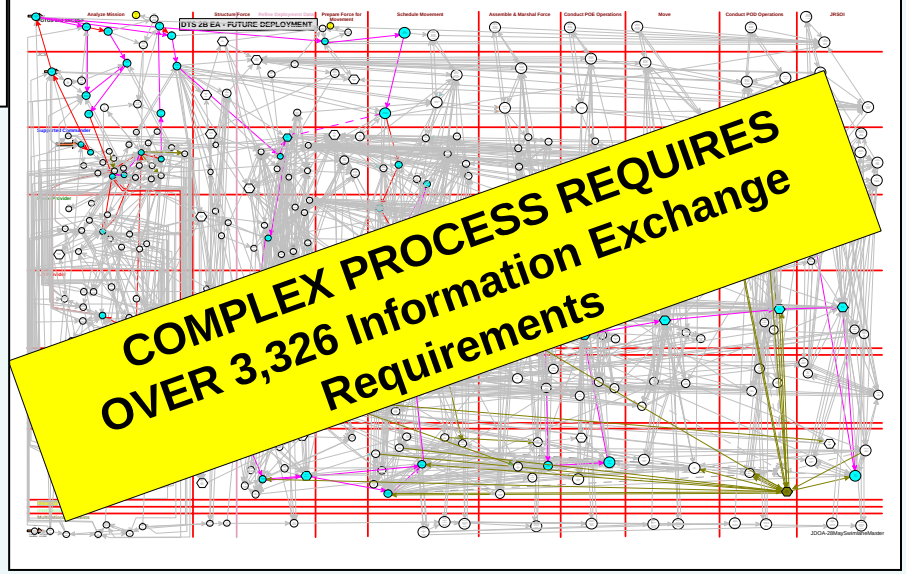
Joint Deployment Process Complexity

Joint Deployment Process Map



Service and Functional Stovepipes have led to a system that lacks:
- **Flexibility**
- **Agility**
- **Responsiveness**

Joint Deployment Process Complexity



23 Major Stakeholders
170+ Supporting Systems
183 Major Process Activities
3000+ Information Exchange Requirements

The Vision For Force Projection

Today's Reality

- **Unwieldy** process for ***capability*** and ***risk*** decisions
- Action officers are data ***collectors***
- Management by ***PowerPoint*** *and* ***Excel spreadsheet***
- Typical response time measured in ***weeks & months***.
- ***"Soda straw"*** visibility of force capabilities and deployment flow
- Track and monitor "***pieces and parts"***
- Service ***unit*** oriented ***regional*** focused force management
- Insufficient, uneven, and untimely visibility of ***Reserve Component*** (RC) capability and pre-mob actions

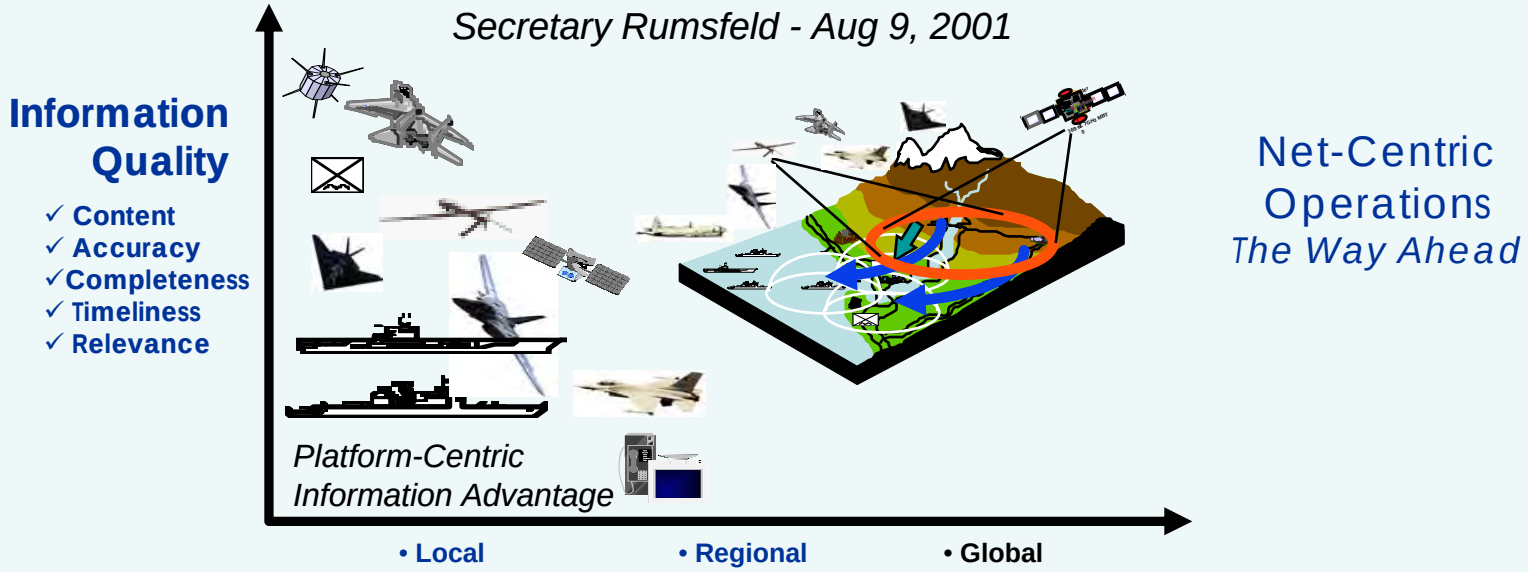
Future Capability

- ***Responsive*** process for ***capability*** and ***risk*** decisions
- Action officers are data ***analysts***
- Manage by continuous access to ***decision quality information***
- Response time measured in ***hours/days and maybe weeks.***
- "***Holistic"*** visibility of end-to-end deployment flow
- Track and monitor ***operational capabilities***
- Service and Joint ***capabilities*** oriented ***Global*** Force Providing / Management
- ***Total Force availability*** and ***capabilities*** are known/visible

Net-Centric Vision

"The ***two truly transforming things***, conceivably, might be in information technology and information operation and ***networking and connecting things in ways that they function totally differently than they had previously***. And if that's possible, what I just said, that possibly the ***single-most transforming thing*** in our force will not be a weapon system, but ***a set of interconnections*** and a substantially enhanced capability because of that awareness."

Secretary Rumsfeld - Aug 9, 2001



Goals of Net-Centricity

- **Make information available on a network that people depend on and trust.**
- **Populate the network with new, dynamic sources of information to defeat the enemy.**
- **Deny the enemy comparable advantage and exploit weaknesses.**

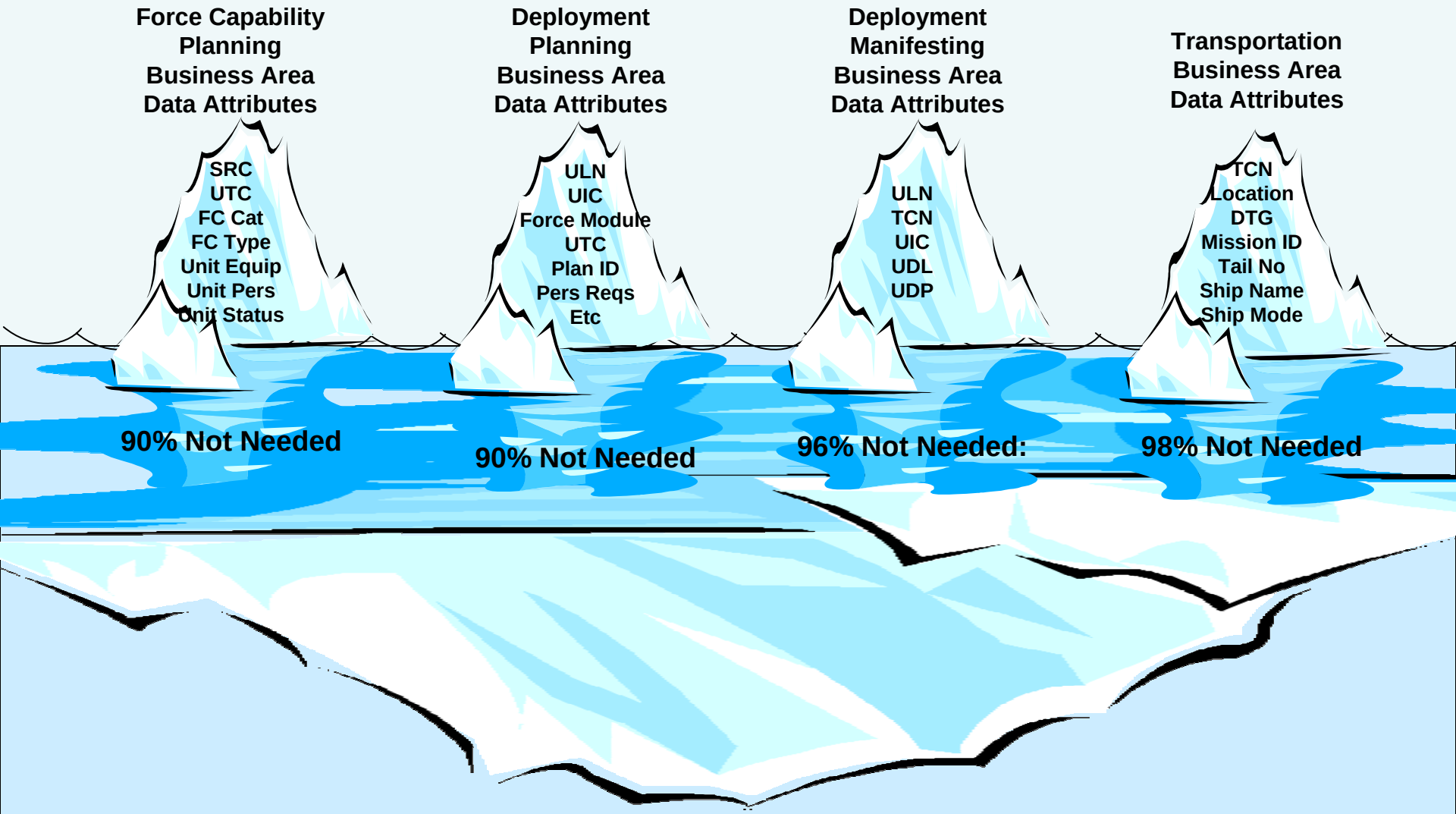
Net-Centric Approach to Force Projection

Current systems are stove piped and application centric; must move to net centric world where data is transparent. Transparent, web enabled data will…

- **Facilitate improved decision making**
  - Accurate deployment estimates
  - Compress planning timelines
  - Increase strategic responsiveness
- **Enable dynamic deployment and force rotation planning**
  - Increased visibility of what is available to move
  - Simplify answering “what if” scenario’s
  - Realize potential of tactical level joint planning
- **Improved transportation support**
  - Accurate lift planning estimates
  - Optimize airlift / sealift decisions
  - Provide near real time force tracking from Origin to Final Destination

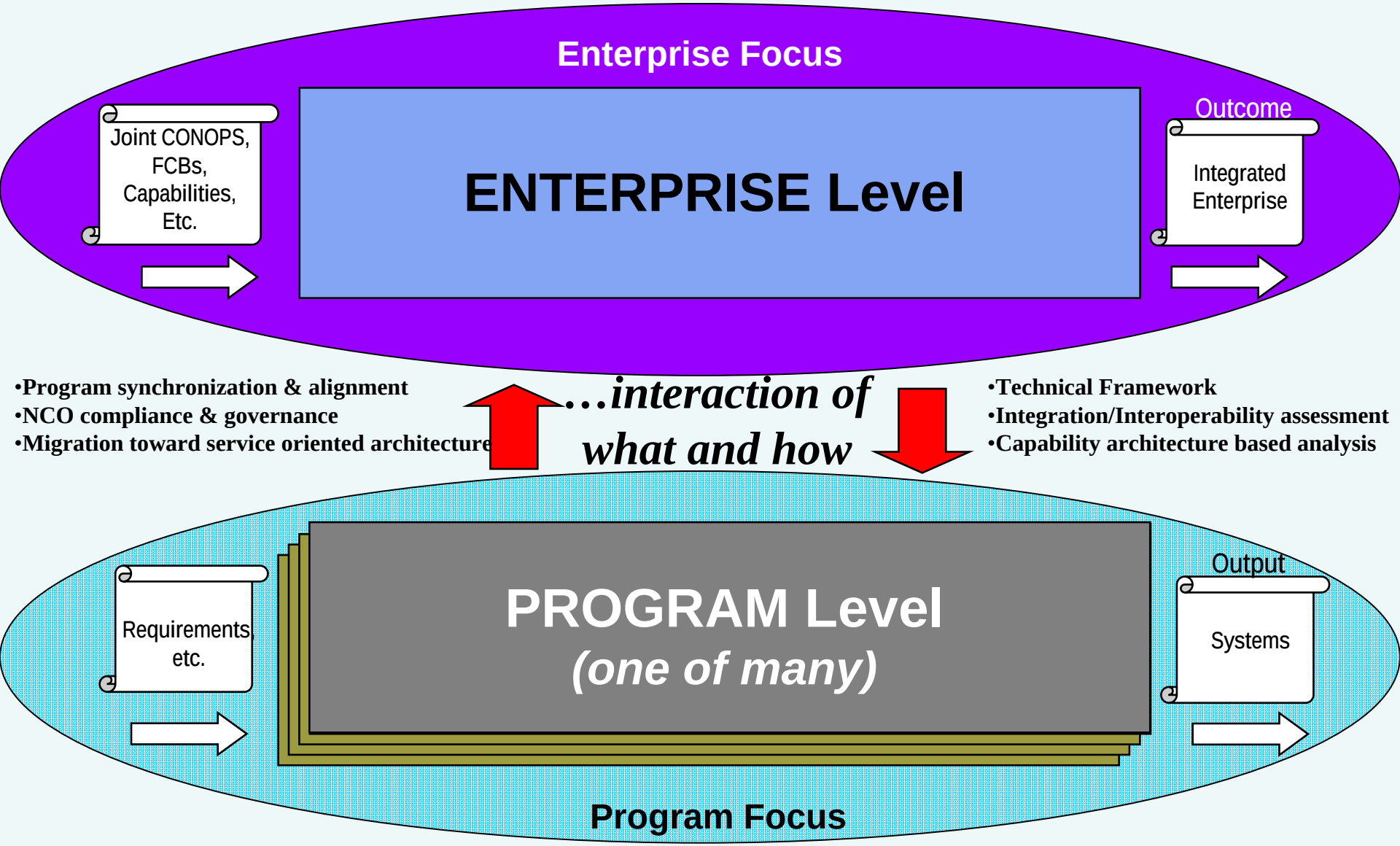
It’s All About the DATA!

Net-Centricity Data Exposure Requirements



BOTTOM LINE: Only a small fraction of individual system data elements require exposure to support Force Projection net-centricity requirements

Enterprise & Program Relationship



Top Down/Bottom Up Collaboration to Achieve Capability Enhancement

Simultaneous Efforts

- **Joint Deployment Protoyping**
  - Information Provided Earlier with More Detail
  - Defined, Understood Data Attributes & Data Relationships
  - Much larger step to an operational environment
  - Smart Push / Smart Pull
  - Live operational data separate from its application, available by a web browser and the right permissions
- **Joint Force Projection ACTD**
  - Technology demonstration to provide the data interoperability and integration across the entire process
  - Key enabler to vision of JC2
  - Brings together a single joint solution vs. having 4 Service solutions that need to be integrated later
- **JDS Mission Area Initial Capabilities Document**
  - Captures the “As-Is” baseline deployment process
  - Identifies the Primary Thread, and related systems in the JDS FoS
- **Force Projection Community of Interest**
  - Data accessibility, visibility and transparency
  - Standard Taxonomy
  - Define data standards
  - Establish connectivity agreements with source system

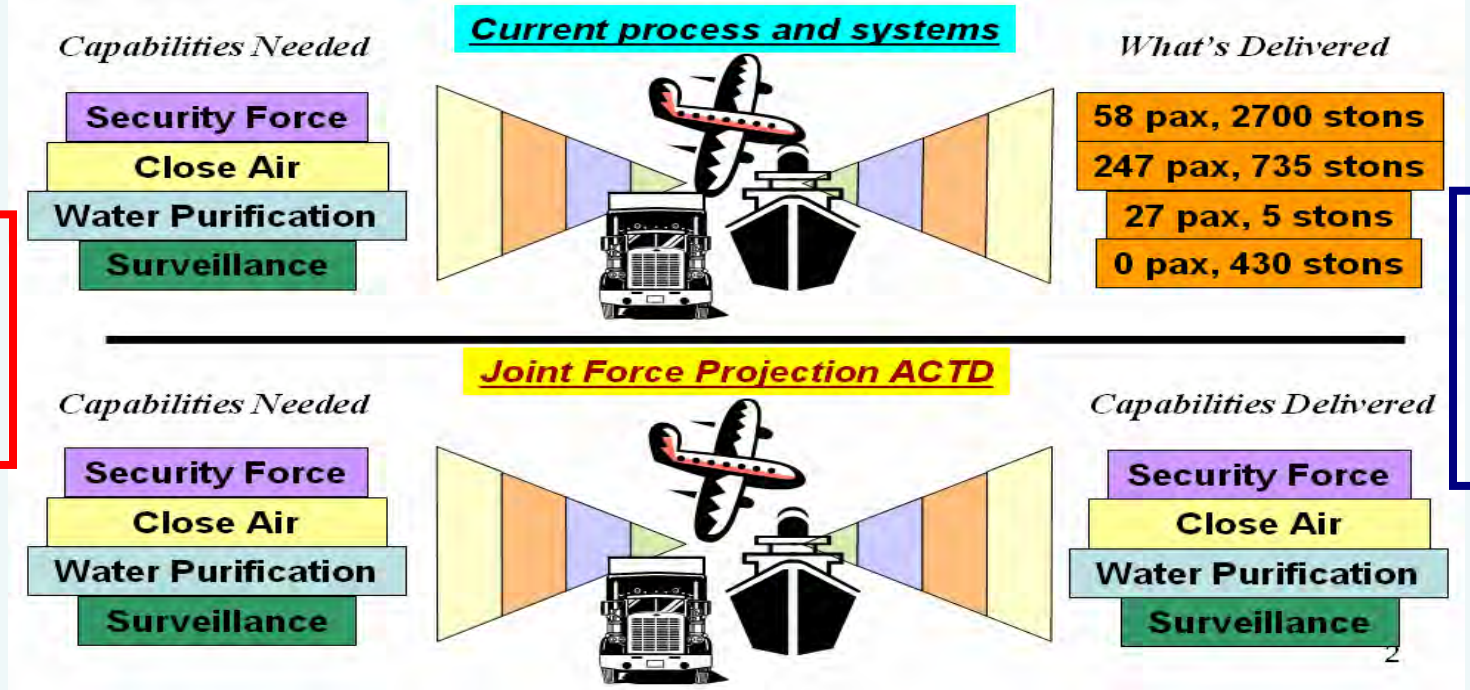
Joint Force Projection J9

FY 05-06, Transition FY 07

GOALS

Identify required ***Joint Force Projection Enterprise Services*** for Net-Centric Operations (FP MCP for JC2)
Demonstrate initial ***Modeling & Simulation*** capability for joint deployment planning and execution
Demonstrate initial ***Joint Reception, Staging, Onward Movement, and Integration (JRSOI) Planning*** *capability*
Ensure ***Enterprise Integration*** of Joint Deployment Family of Systems (FoS)

Pilot MCP (web-service) for JC2



Integration of mature technologies to solve a complex problem

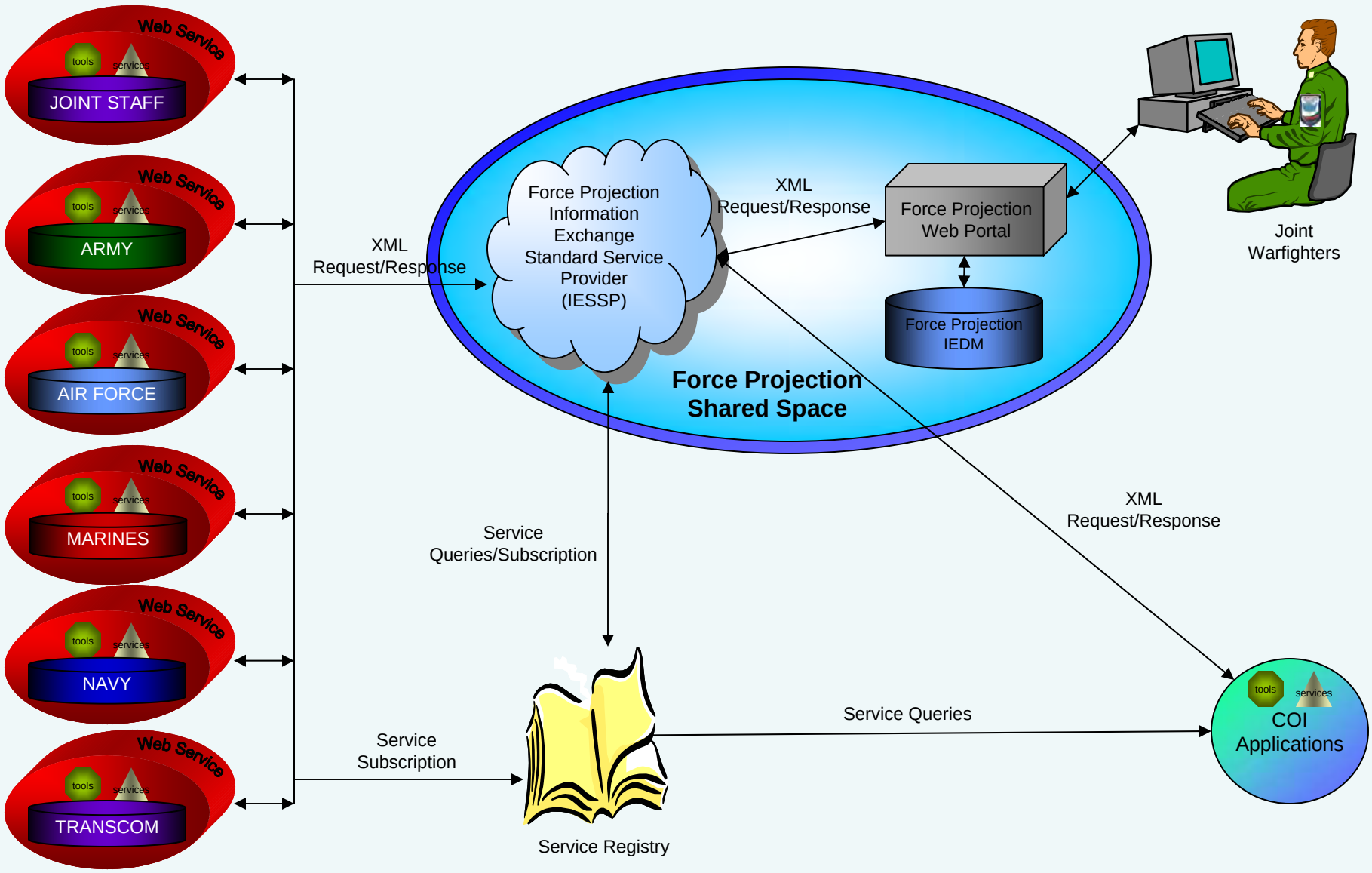
Capabilities

- End-to-end planning and execution of JDP
- End-to-end mod & sim of JDP
- Joint JRSOI tool
- Enterprise (Database) Integration

Systems/Hardware

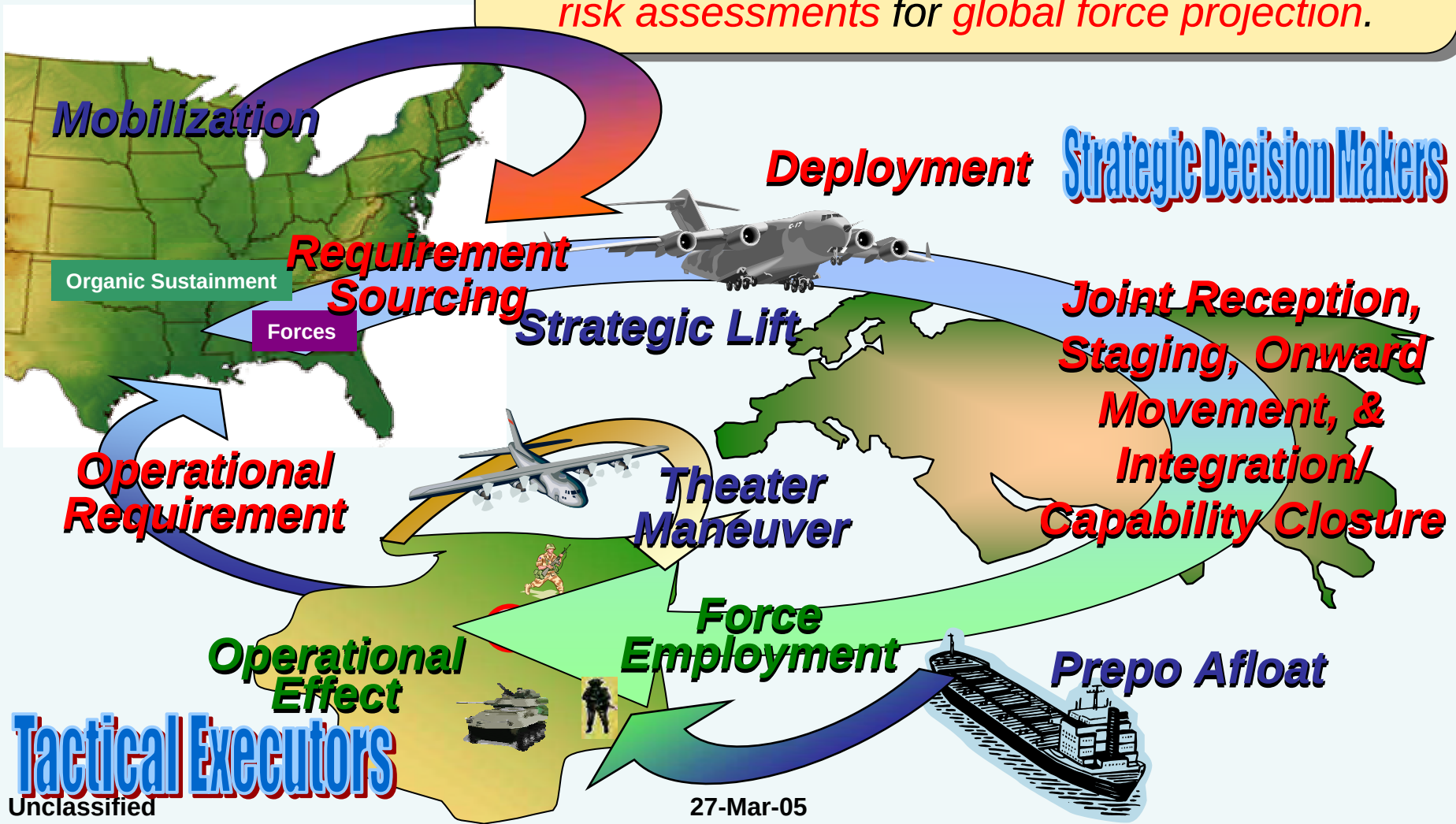
- Web-portal – One-stop Force Projection tool (JC2 MCP)
- Database Integration (XML)
- Smart search tools
- JRSOI planning and execution tool
- Mod & Sim tool suite
- Associated server architecture

Force Projection COI



Joint Force Projection Vision

A responsive and adaptive, knowledge-based process that enables decision-makers at all levels the ability to make timely, accurate decisions and risk assessments for global force projection.



BACKUP Slides

JFP ACTD

-- Executive Summary --

Objective: Provide warfighters a simple, timely, comprehensive understanding of deployment and distribution information. Increase their ability to see and influence the sourcing, projection and integration of Force Capabilities.

Why an ACTD?: Before we can exercise sufficient control over the deployment and distribution pipeline from end to end, we must integrate the stove piped processes, systems and data underlying the pipeline

The Product: A single integrated force projection picture that links operators and logisticians at Service, Joint, and Agency levels by using real time, web-based, and network-centric information systems.

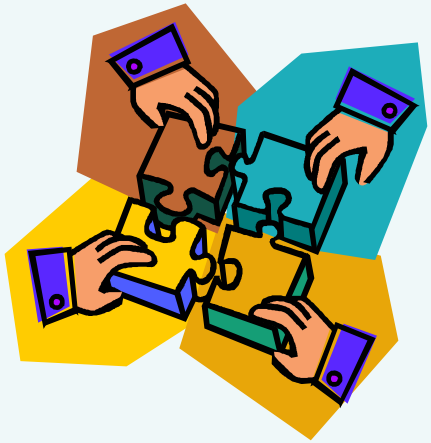
The Expected Result: Supported joint force commanders will be provided a significantly higher degree of certainty that required forces, equipment, and sustainment will arrive where needed, on time, and prepared for employment.

JFP ACTD

-- Primarily Integration Not Development --

Programs that may be included:

- CFAST
- AT-21
- GTN-21
- ELIST
- JCRT
- DRRS
- JESS
- CORSOM
- JWARS
- ASPEN
- CTL
- JTL
- JL



The missing piece is the seamless linkage between them

Using net-centric solutions and mature technology, JFP will provide the capability to monitor, model, simulate, and execute joint force deployments

JFP ACTD

-- Expected Results --

Single web-portal for joint force projection information need.

- Designed for all joint force projection users
- Eliminates need to have multiple systems to get the full picture
- Supports full spectrum of operations
- Single system for operations and training/exercises

Tools for Shared Visualization of the Deployment Process

- All users can share common view of the current deployment status
- Commander's intent clearly communicated to all echelons
- Allows for precise measurements of performance to validate discipline

Single system to gain the full joint perspective

- Cross reference of base operating support assets
- Insight into mutual support issues

Tool suite for JRSOI operations

- Agile enough for any operation, in any theater
- Smooth the seam between strategic and theater distribution systems

Joint Deployment Systems

-- Mission Area Initial Capabilities Document --

- Describes the overarching interoperability requirements for joint deployment systems
- Facilitates integration of deployment systems at the tactical/ operational levels with applications supporting deployment and force projection at the operational / strategic levels
- Provides baseline criteria for the development of requirements documents for future and legacy deployment systems

MISSION AREA
INITIAL CAPABILITIES DOCUMENT

JOINT DEPLOYMENT SYSTEMS (JDS)

JROCM 107-03
8 May 2003

Designation: JROC Interest

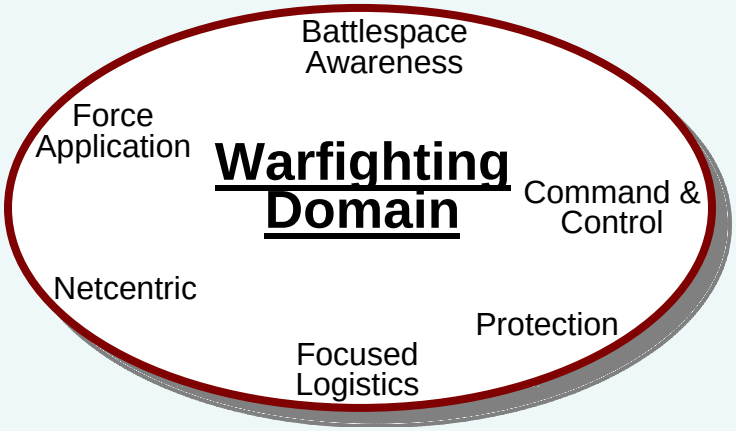
USJFCOM
J-9 JDPO
Phone: 757.836.2010

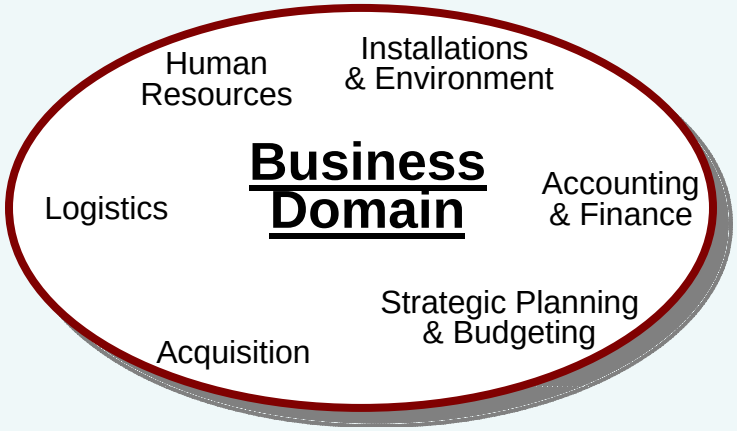
Mission Area – Initial Capabilities Document
Joint Deployment Systems (JDS)

IT Portfolio Management

22 March 2004 OSD Memo:
Establishes policy and assigns responsibilities for managing IT investments as 'portfolios', based on the [GIG] Integrated Architecture.

Applies to the six JWCA / Warfighting Domains, six Business Domains, and the underlying [GIG] Enterprise Information Environment.





Enterprise Information Environment

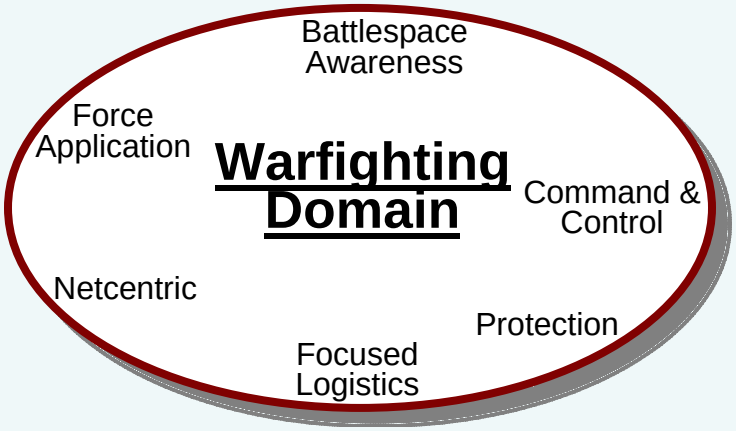
…Improved and timely IT investment policies area a cornerstone to enable change throughout the Department, assure that we have the right IT capabilities to perform our mission and conduct effective information operations, eliminate outdated ways of doing business, and achieve our net-centricity goals.

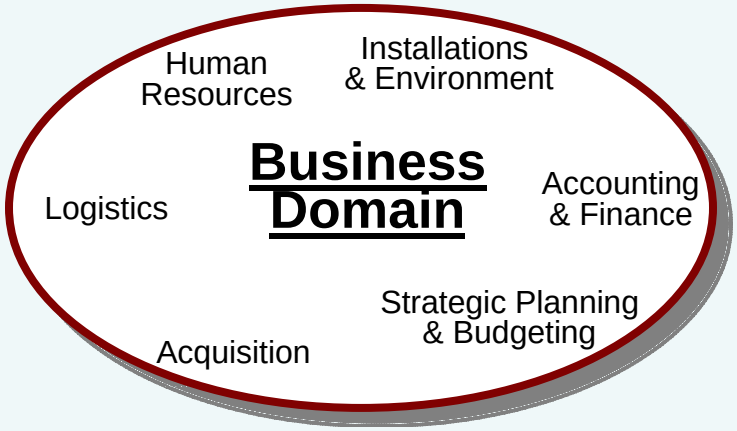
-- Mr. Wolfowitz, 22 March 2004.

IT Portfolio Management

JDPO Issue: Manage the sub-portfolio for Core Joint Deployment Systems (JDS) supporting the Primary Thread of the Joint Deployment Process (JDP).

Provides consistency of management oversight with the JDS MA ICD. Ensures that the same organization manages the JDP the IT sub-portfolio for JDS.





Enterprise Information Environment

Includes management oversight for systems outside the Distribution PfM lane, but impact / contribute to the JDP.

Builds a case for PfM of these systems with the Warfighting Domains.

BACKUP Slides
Deployment Problems

Strategic Planning

-- *Behind the Power Curve* --

Combat Team: 2,000 PAX, 4800 Tons

CDR: COURSE OF ACTION APPROVED

CDR: REQUEST FOR FORCES

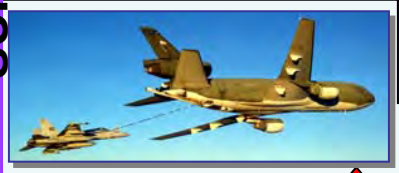
SECDEF: SIGN DEPLOYMENT ORDER

USTRANSCOM: DEPLOYMENT ACTIONS

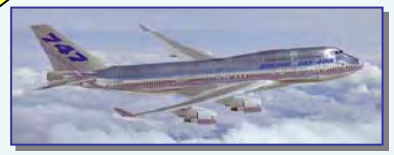
D-60 D-50 D-45 D-40 D-30 D-20 D-10 D DAY

DEPLOYMENT SUPPORT

AIR



DEPLOYMENT SUPPORT



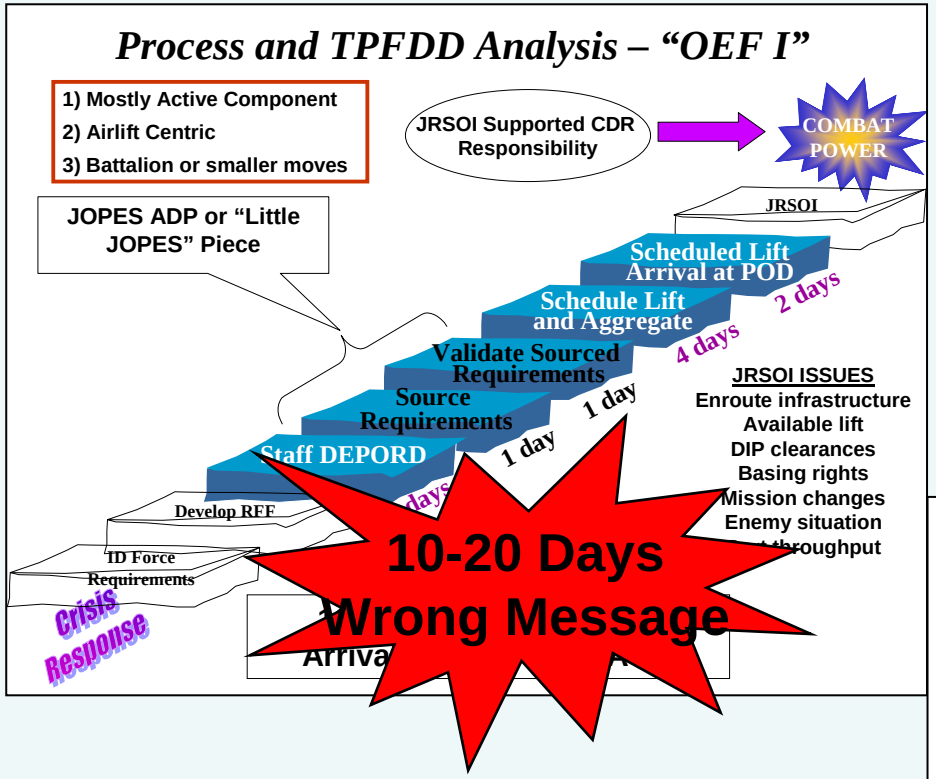
SEA/AIR

Data Transparency

We Want to Be Here…

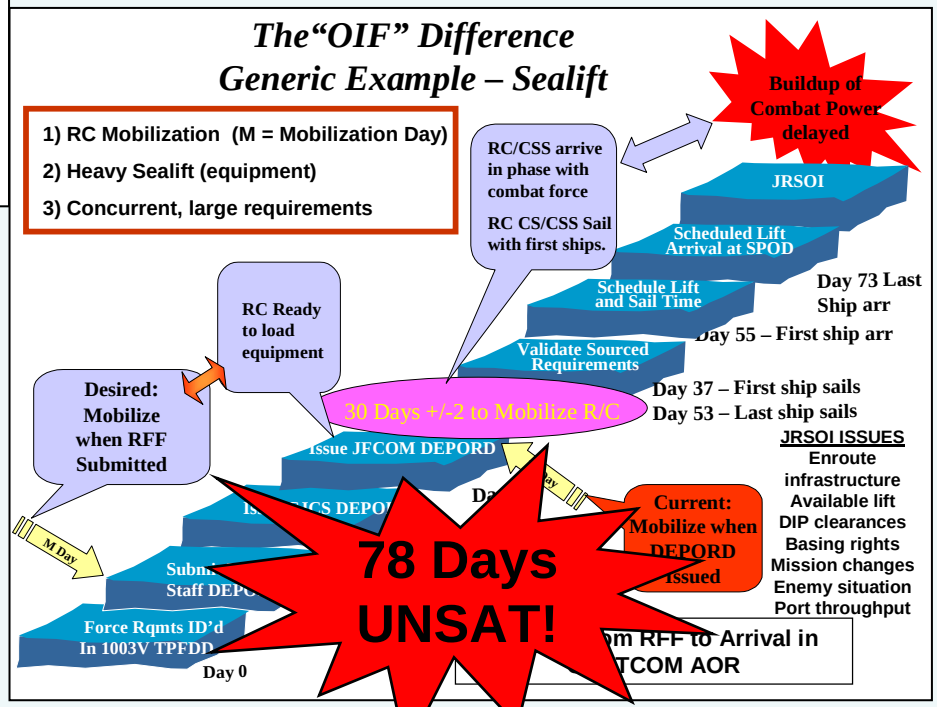
But We Typically Operate Here! --Compressed for Time

Crisis Response Still Too Long



Deployment Reality:

Operational requirements change during mission execution. Joint deployment process business rules and systems interoperability must be significantly improved to support a dynamic operational environment.



Improving decision making and initial deployment response time lay in improving

DATA TRANSPARENCY.

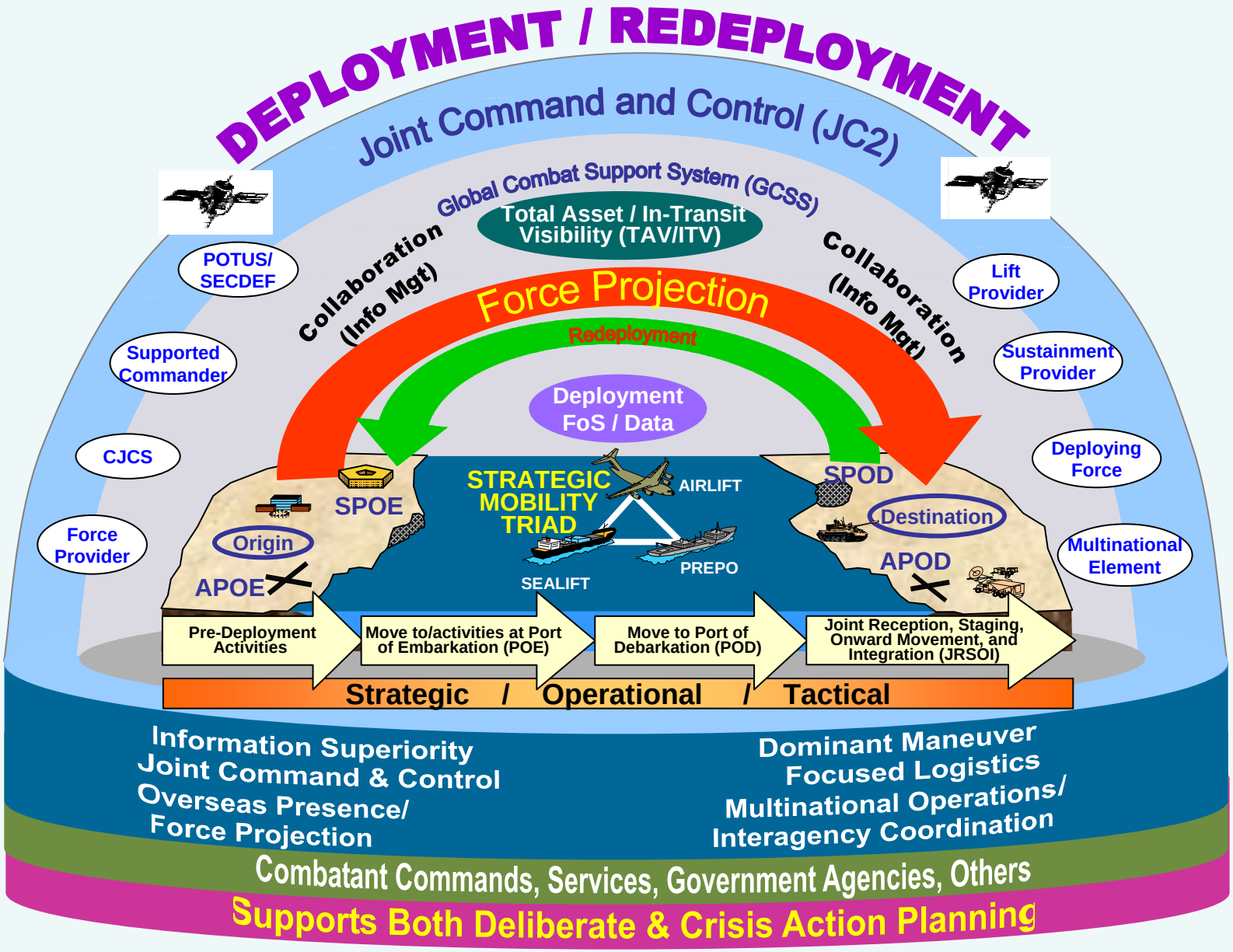
BACKUP Slides
Netcentricity

DoD's Net-Centric Data Strategy

- **The Net-Centric Data Strategy (signed May 9, 2003) provides the foundation for managing the Department's data in a net-centric environment, including:**
  - **Ensuring data are visible, accessible, and understandable when needed and where needed to accelerate decision making**
  - **"Tagging" of all data (intelligence, non-intelligence, raw, and processed) with metadata to enable discovery by known and unanticipated users in the Enterprise**
  - **Posting of all data to shared spaces for users to access except when limited by security, policy, or regulations**
  - **Organizing around Communities of Interest (COIs) that are supported by Warfighter, Business, and Intelligence Domains.**

BACKUP Slides
Joint Deployment / Force Projection

Questions?


DEPLOYMENT / REDEPLOYMENT
Joint Command and Control (JC2)
Global Combat Support System (GCSS)
Total Asset / In-Transit Visibility (TAV/ITV)
Collaboration (Info Mgt)
Collaboration (Info Mgt)
Force Projection
Redeployment
Deployment FoS / Data
POTUS/ SECDEF
Supported Commander
CJCS
Force Provider
Lift Provider
Sustainment Provider
Deploying Force
Multinational Element
STRATEGIC MOBILITY TRIAD
AIRLIFT
SEALIFT
PREPO
SPOE
Origin
APOE
SPOD
Destination
APOD
Pre-Deployment Activities
Move to/activities at Port of Embarkation (POE)
Move to Port of Debarkation (POD)
Joint Reception, Staging, Onward Movement, and Integration (JRSOI)
Strategic / Operational / Tactical
Information Superiority
Joint Command & Control
Overseas Presence/ Force Projection
Dominant Maneuver
Focused Logistics
Multinational Operations/ Interagency Coordination
Combatant Commands, Services, Government Agencies, Others
Supports Both Deliberate & Crisis Action Planning

BACKUP Slides
JFP ACTD

Joint Force Projection

-- Advanced Concept Technology Demonstration (ACTD) --

- Problem: Can't exercise sufficient control over the deployment and distribution pipeline from end to end; or provide a high degree of certainty to the supported commander that required forces, equipment, sustainment, and support will arrive where needed and on time, prepared for employment.
- Objective: Provide warfighters a simple, timely, comprehensive understanding of deployment and distribution information. Increase their ability to see and influence the sourcing, projection and integration of Force Capabilities.

- Technologies
  - Semantic Web advances (XML/OWL)
  - Net-Centric, Portal Environment
  - JC2/NCES Common Services
- Active Coordination Technology
  - Web-based Collaborative Visualization
  - Intelligent Software Agents
- Residuals
  - JFP prototype DSTs and data model
  - Software, documentation and TTPs
  - Training support packages
  - Associated server hardware

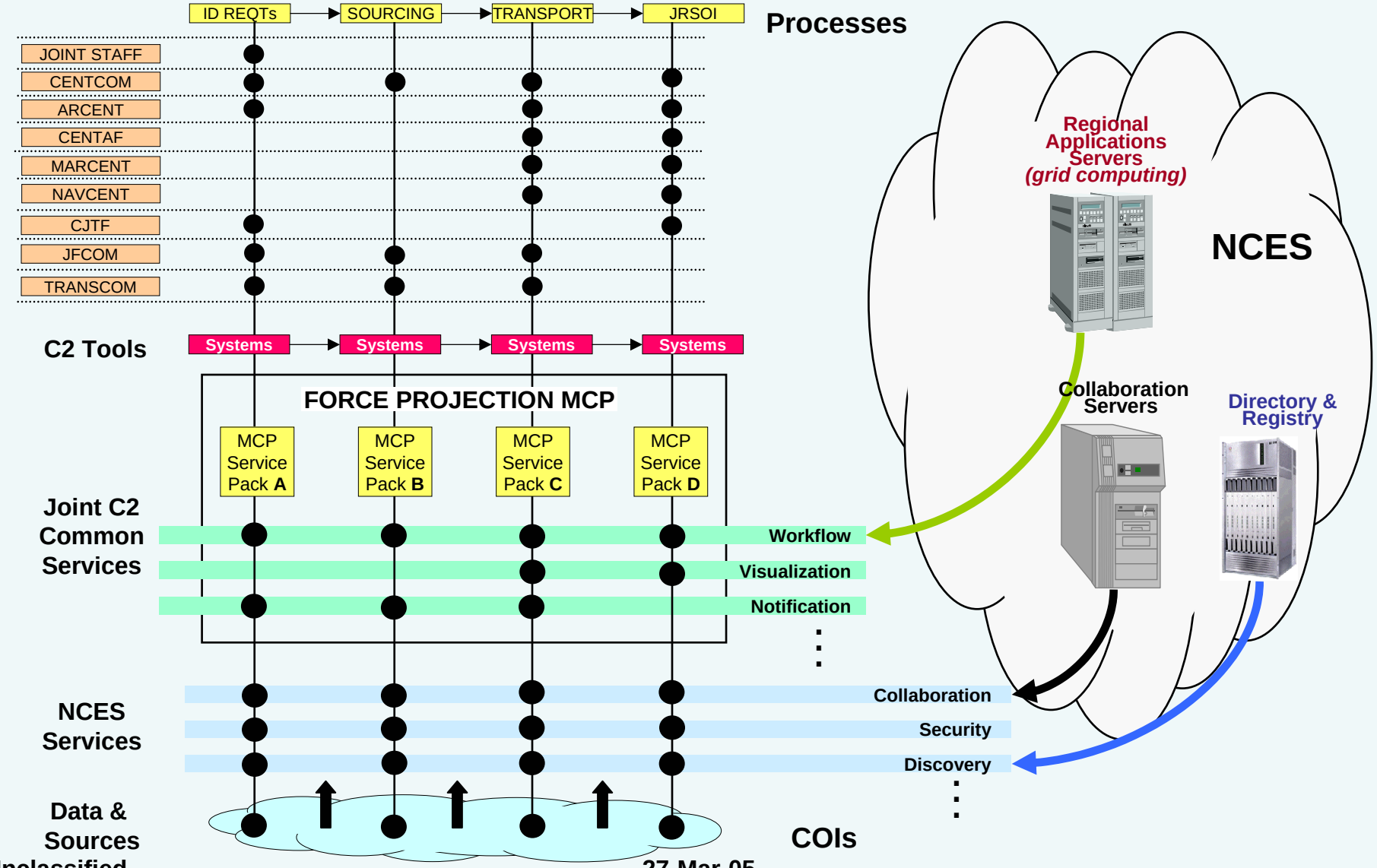
- Participants
  - User-Sponsors – USJFCOM
  - Proposed Lead Agency - DISA
  - Technical Manager –DISA AITS-JPO
  - Transition Manager – DISA JC2
  - Operational Manager –USJFCOM J9/JDPO
- Schedule
  - FY05: Identify Requirements/ Develop 1st Spiral
  - FY06: Spirals 2/3, Utility Assessment
  - FY07: Maintenance and Transition

- Comments
  - JFP ACTD enhances JDPO and DPO efforts in Prototyping and Reengineering the joint deployment and distribution processes
  - JFP ACTD supports end-to-end joint deployment and distribution planning, analysis, and execution
  - JFP ACTD enables joint deployment process to meet rapid force projection requirements envisioned in JV 2010/2020.
  - JFP ACTD enables the JFC to make better risk decisions relative to joint deployment and the joint force mission.

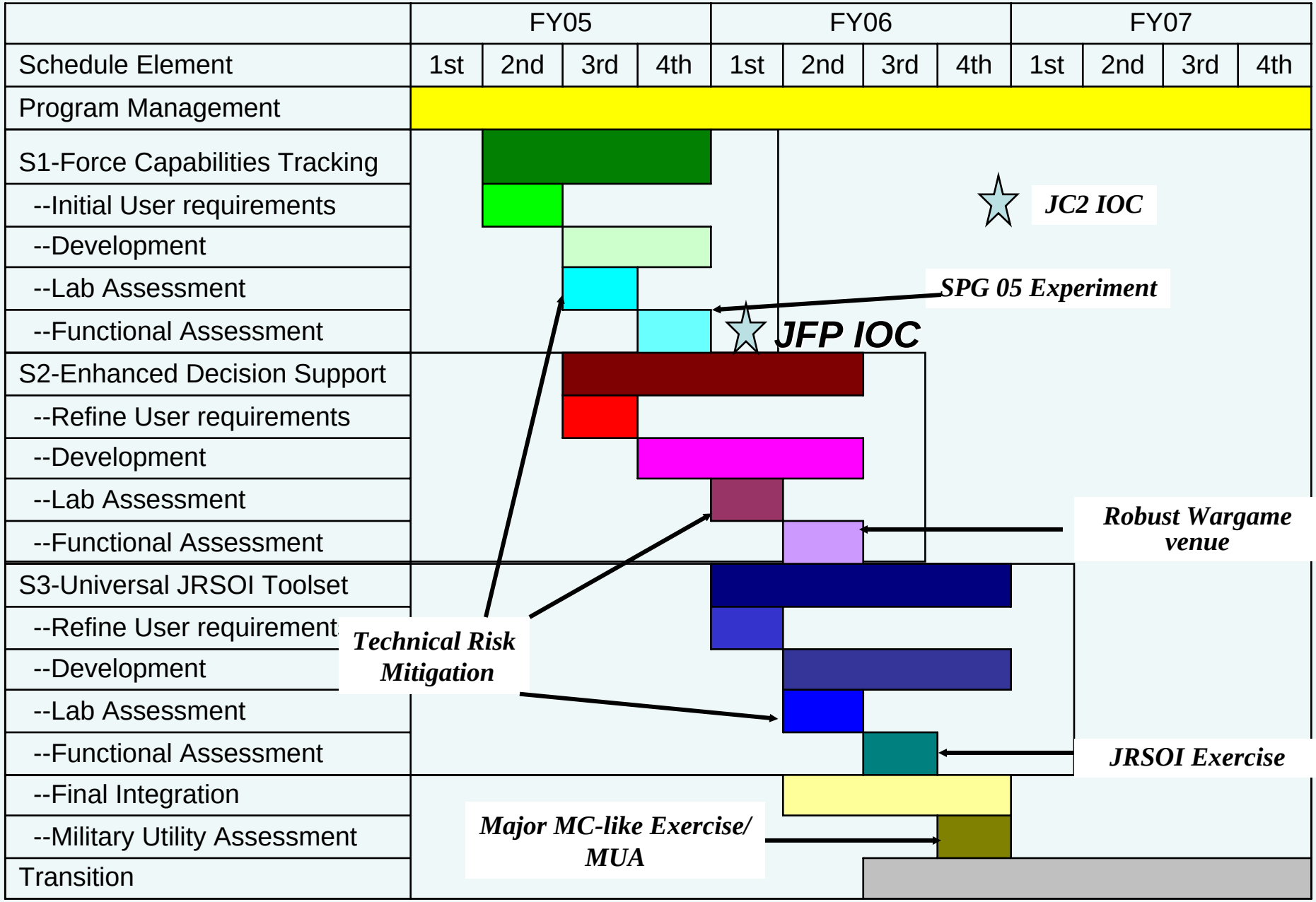
JFP ACTD Technicalities

- **Technologies**
  - **Semantic Web advances (XML/OWL)**
  - **Net-Centric, Portal Environment**
  - **JC2/NCES Common Services**
- **Active Coordination Technology**
  - **Web-based Collaborative Visualization**
  - **Intelligent Software Agents**
- **Residuals**
  - **JFP prototype DSTs and data model**
  - **Software, documentation and TTPs**
  - **Training support packages**
  - **Associated server hardware**

JFP Family of Systems (FOS) & JC2 Web-Centric Processing



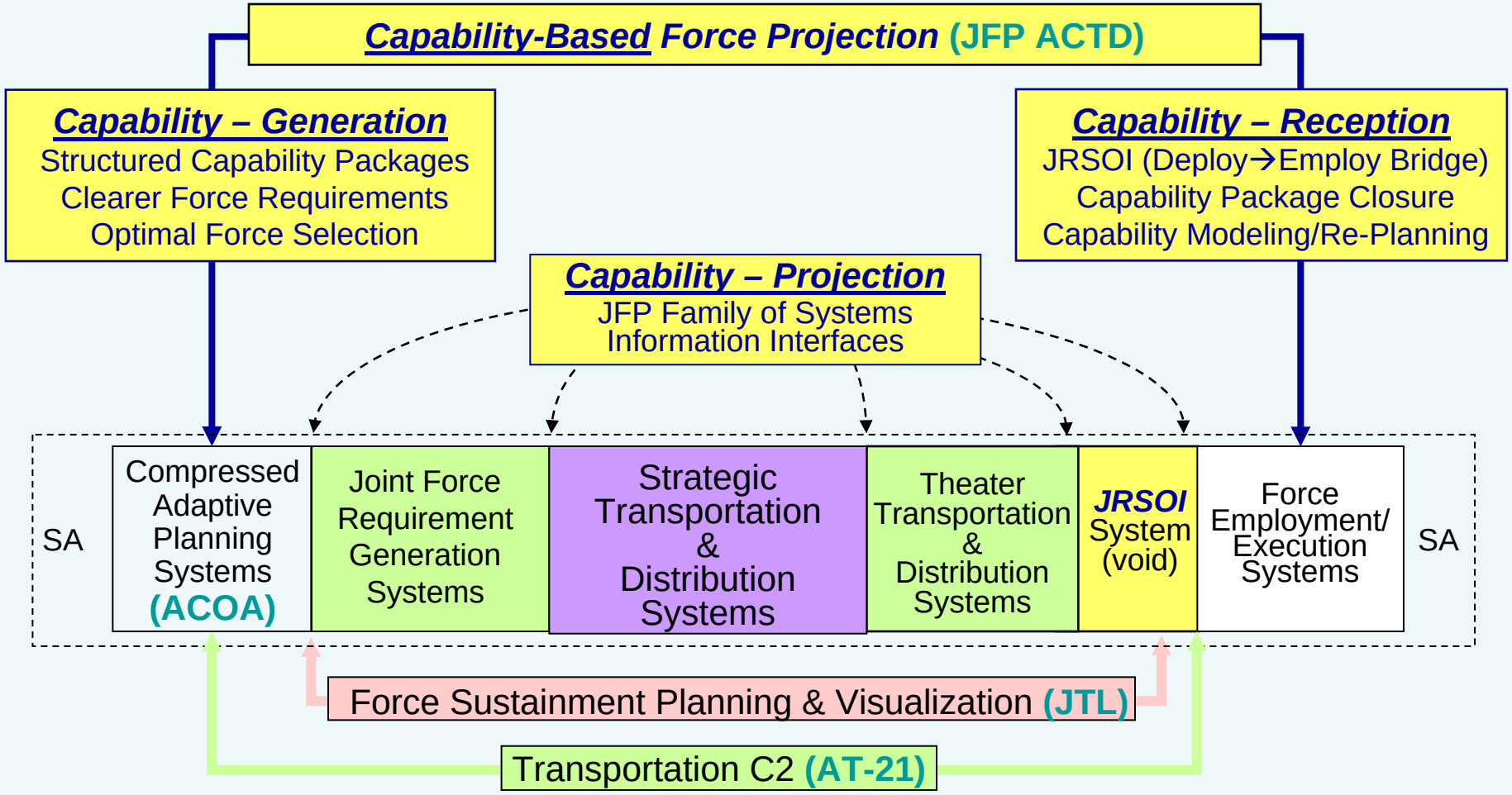
JFP Schedule



JFP Product List (cont)

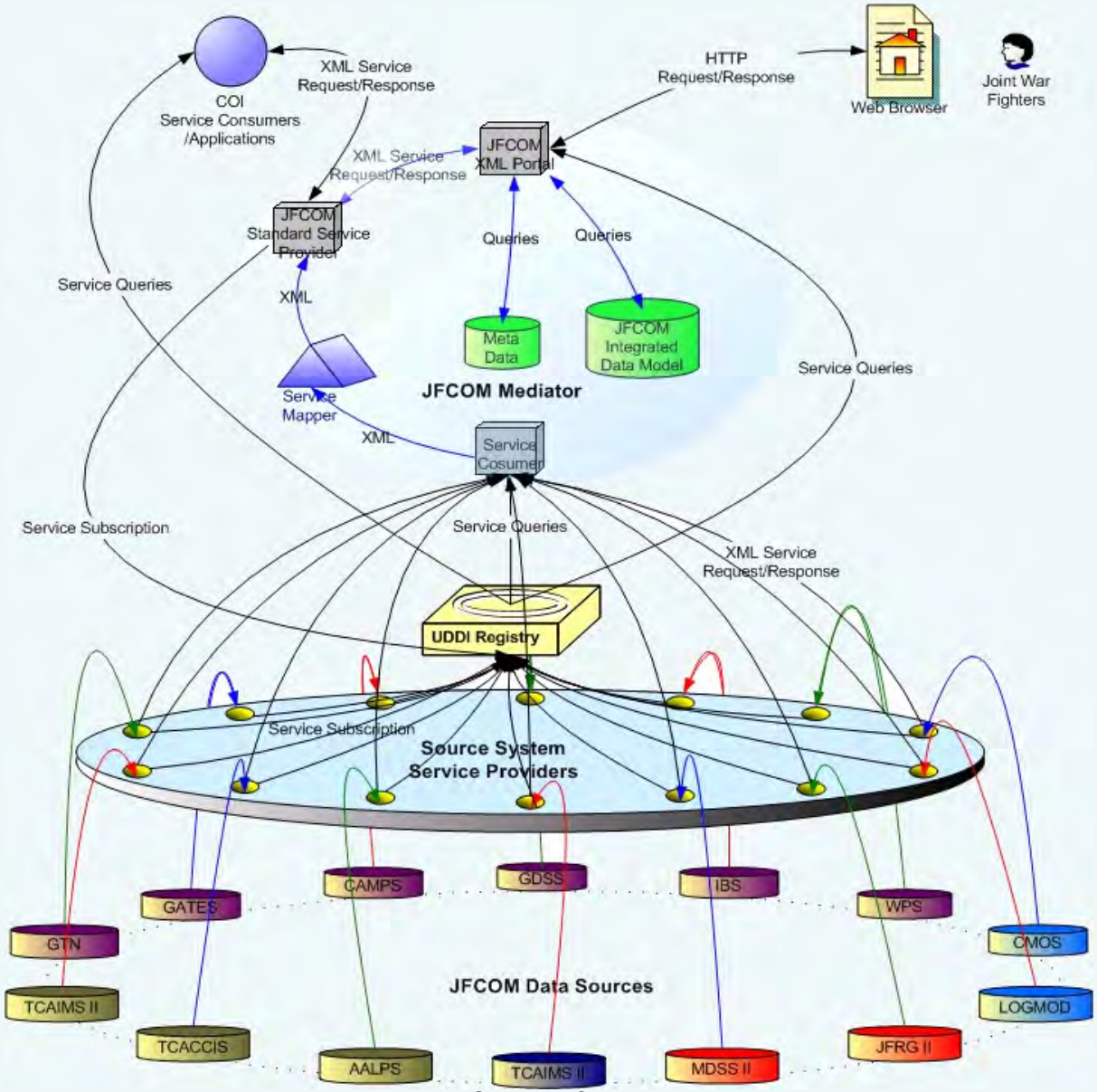
- Single system to gain the full joint perspective
  - Cross reference of base operating support assets
  - Insight into mutual support issues
- User friendly interface with built-in business rules
  - Removes the manpower burden required to perform today's deployments
  - Capture automated technologies for planning, execution, and force sustainment
  - Facilitates standardization of process, procedures, and interoperability
- Tool suite for JRSOI operations
  - Agile enough for any operation, in any theater
  - Smooth the seam between strategic and theater distribution systems

JFP ACTD
-- Related Efforts --



BACKUP Slides
Force Projection COI

Force Projection COI



Force Projection COI

-- *What We Have Learned* --

- Architecture + Data = Process and System Integration & Interoperability
- Prototypes & Experimentation
  - Information Provided Earlier with More Detail
  - Defined, Understood Data Attributes & Data Relationships
  - Much larger step to an operational environment
- Acquisition
  - Delivering the operational capability
  - Effect on the COI (JCIDS, Portfolio Management)
- COI Management
  - Organizational Structure
  - Roles and Responsibilities

NDIA Net Centric Operations, Interoperability & Systems Integration Conference: *Industry Panel 1*

Netcentricity: An Industry Perspective

Industry Panel Moderator: C. Stephen Kuehl -- AIAA NCO PC Chairman

Raytheon Technical Services Co., LLC Engineering & Production Support Indianapolis, IN
Phone Number: 317-306-4230

Email: charles_s_kuehl@raytheon.com

AIAA
American Institute of Aeronautics and Astronautics

23 March 2005

Industry Panel 1 Perspectives

- Systematic Approach To Achieving Levels Of Interoperability
- Cultural Barriers To Interoperability
- Net Centric Enterprise Services: Projected Deployment Perspectives

NDIA Net Centric Operations, Interoperability & Systems Integration Conference: *Industry Panel 2*

Netcentricity: An Industry Perspective

Industry Panel Moderator: C. Stephen Kuehl -- AIAA NCO PC Chairman

Raytheon Technical Services Co., LLC Engineering & Production Support Indianapolis, IN
Phone Number: 317-306-4230

Email: charles_s_kuehl@raytheon.com

AIAA
American Institute of Aeronautics and Astronautics

23 March 2005

Industry Panel 2 Perspectives

- Architecture Framework: FCS NCES Interoperability Case Study …
- How to Commoditize SOA & Implications to Interoperability …
- Netcentricity Deployment Challenges …

Achieving Net Centric Operations

Presented to the

NDIA Conference on Net Centric Operations, Interoperability & Systems Integration

Glenn F. Lamartin
Director, Defense Systems
March 21, 2005

Framing the Conference

- Why it is important
- Who we will hear from
- What we will hear
- Challenges we should consider
  - Operations
  - Technology and design
  - Acquisitions
  - Business

Current Situation
What We Need to Do Better

Requirements

- Adapting to changing conditions
- Matching operational needs with solutions
- Overcoming biases of Services and others
- Moving to transform military

PPBES

- Laying analytical foundation for budget
- Aligning budgets with acquisition decisions

Personnel and Readiness

- Treating people as a resource

Acquisition

- Acquiring systems-of-systems
- Making system decisions in a joint, mission context
- Transitioning technology
- Assessing complexity of new work and ability to perform it
- Controlling schedule and cost
- Passing operational tests
- Ensuring a robust industrial base

Sustainment

- Controlling O&S costs
- Reducing logistics tails

Net-Centric Operations – Operational Objectives and Challenges

- How can net-centric operations help meet the Department's transformational warfighting objectives?
- If we build the perfect net-centric environment, will the operators use it?
- Will users make their information visible and available?
- Will users trust the information?
- Will they be willing to make engagement decisions on the information made available?
- Who will "own" and operate the network?

Net-Centric Operations – Technology and Design Challenges

- Where is the “edge”?
- How to balance the benefits of a “centralized” service-oriented architecture with the need to retain organic capability down at the tactical unit or individual warfighter?
- What are the challenges of designed interdependency?
- Will the enabling technologies be available and affordable when we need them?
- How to make the net-centric environment secure?
- Will the appetite for bandwidth be in line with the bandwidth available?

Net-Centric Operations – Acquisition Challenges

- How do we translate early and still formative net-centric concepts into something we can put on "real world" contracts?
- How do we align user expectations with what the acquisition system can realistically deliver?
- How best to synchronize programs to deliver the greatest potential capability in a timely, coherent, and affordable way?
- How do we perform systems engineering in a system-of-systems environment?
- How do we test the system-of-systems given real-world operations and constraints?
- How do we properly allocate resources?

Net-Centric Operations – Business Challenges

- How do we make the business case for net-centric operations?
- How much will it cost?
- What metrics show the value of net-centric operations?
- What is the return on investment?
- Who will pay?

Executive Plenary Panel – Achieving Net Centric Operations

- **Panelists:**
  - **Mr. John Garstka, OUSD(Office of Force Transformation), Assistant Director for Concepts & Operations**
  - **Ms. Priscilla Guthrie, OASD(NII), DoD Deputy CIO**
  - **LTG Robert Wagner, USA, JFCOM, Deputy Commander**
  - **COL(P) Susan Lawrence, Joint Staff, J6**
  - **LTG Joe Yakovac, USA, ASA(AL&T), Mil Dep**

Questions?

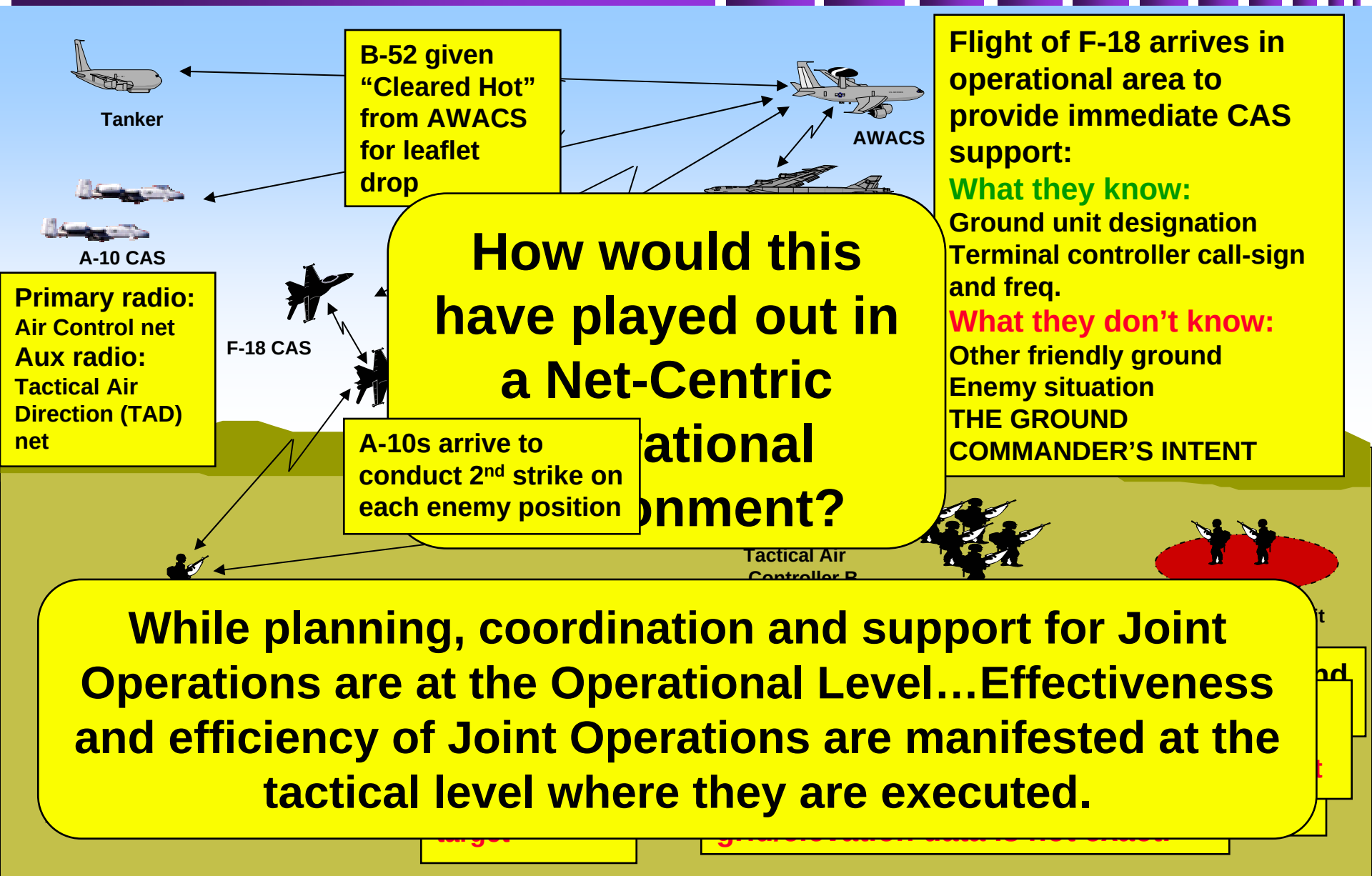
NDIA Conference – Executive Plenary Panel

COL(P) Susan Lawrence

Vice Director for Command, Control,
Communications, and Computer Systems (VJ6)

The Joint Staff

Operation Anaconda

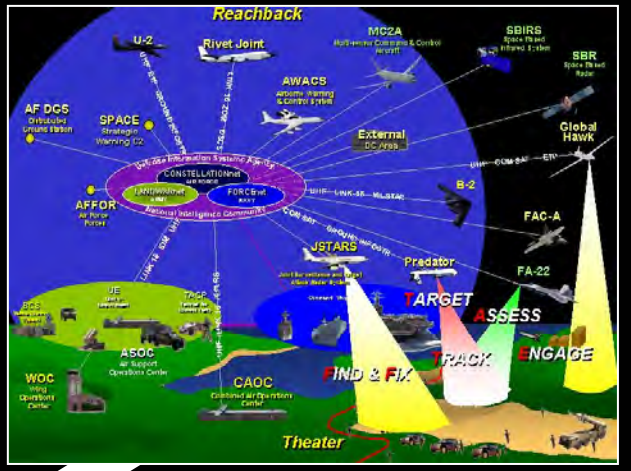


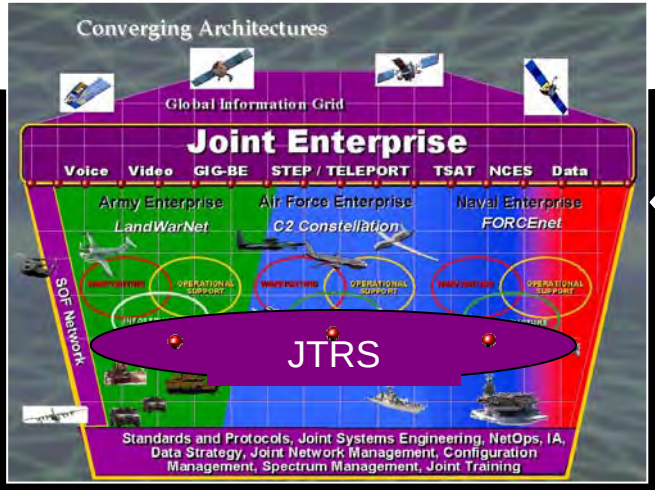
Keys to Achieving Net-Centric Operations

- Overall Joint Integrating Architectures and Systems Engineering Effort
- The need for Common Naming/Data Strategy
- Cultural Challenges - Transformation Requires Us to Change How We Operate Today
- We must have Trained, Educated and Certified Joint C4 Personnel AND Network Users
- Joint Configuration Management & Network Management
- Strengthening Information Assurance
- Enhancing Spectrum Utilization
- A Need for More **JOINT** Experimentation/Testing

On the future: "…the outcomes we must achieve: fundamentally joint, network-centric, distributed forces capable of rapid decision superiority and massed effects across the battlespace." *Secretary of Defense Donald Rumsfeld*

Joint Enterprise





Converge on common set of standards and interfaces

NDIA Conference – Executive Plenary Panel

COL(P) Susan Lawrence

Vice Director for Command, Control,
Communications, and Computer Systems (VJ6)

The Joint Staff

Joint Cruise Missile Defense Joint Test and Evaluation

JCMD JT&E

JCMD JIADS
Modeling and Simulation
“Operation Open Passage”

JCMD JT&E Purpose and Objectives

Purpose:

Characterize the current and near-term effectiveness of a typical JIADS in countering the cruise missile threat

Objectives:

- Provide a timely definitive assessment of CMD capability
  - **Assess current and evolving TTP and CONOPS**
  - **Provide recommendations for improvements**
- Develop a joint test methodology for cruise missile defense
  - **Leverage existing, operationally realistic exercises**
  - **Establish simulation capability for assessing CMD**

JCMD Focus


E3 AWACS


E-2 HAWKEYE


F-14


F-18


F-16


F-15


CRC/TPS-75

JIADS


TAOC/TPS-59

Land Attack Cruise Missile

THREAT

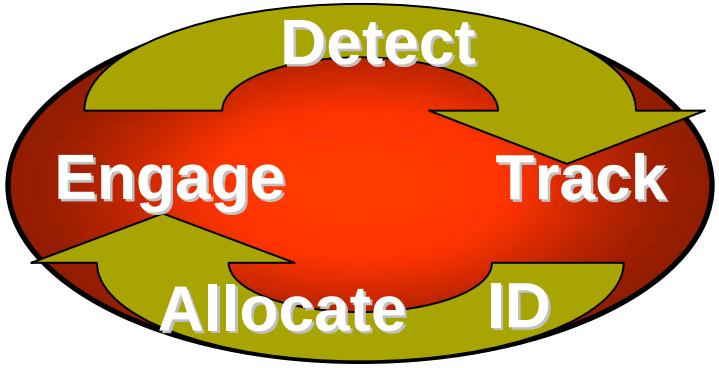

SENTINEL


AEGIS


AVENGER


PATRIOT


LINEBACKER

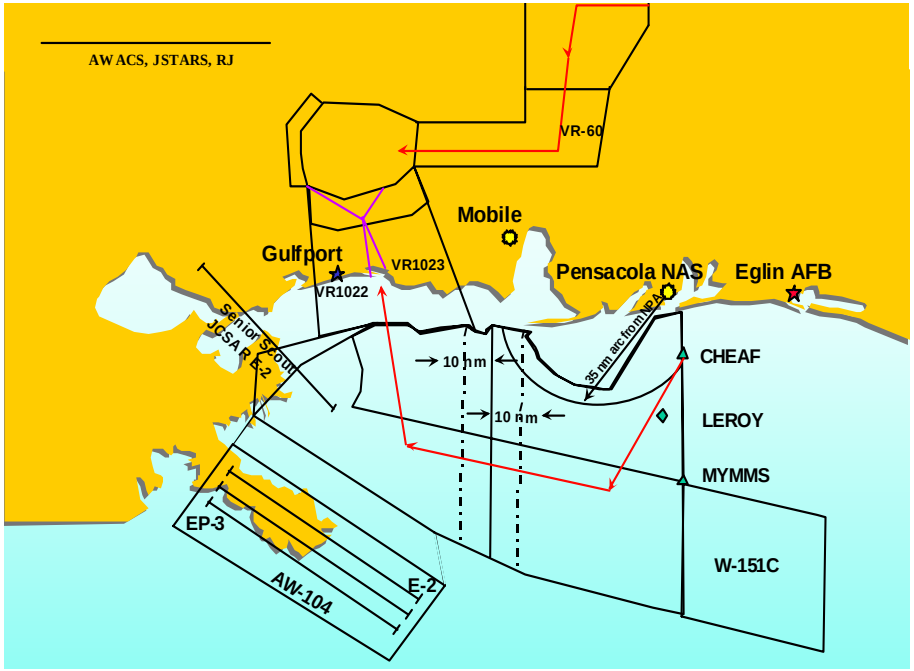


Evaluation Approach

Integrates Field and Simulation Testing

Field Test (FT)

Mini Test	ASCIET	Mar 00
FT-1	JCIET	Apr 02
FT-2	CJTFEX 04-2	Jun 04



ASCIET All Services Combat Identification Evaluation Team

JCIET Joint Combat Identification Evaluation Team

CJTFEX Combined Joint Task Force Exercise

Simulation Test (ST)

ST-1	VWC	Sep 2002*
ST-2	VWC	Mar 2004**

* Included 2 distributed sites

** Included 8 distributed sites

VWC Virtual Warfare Center

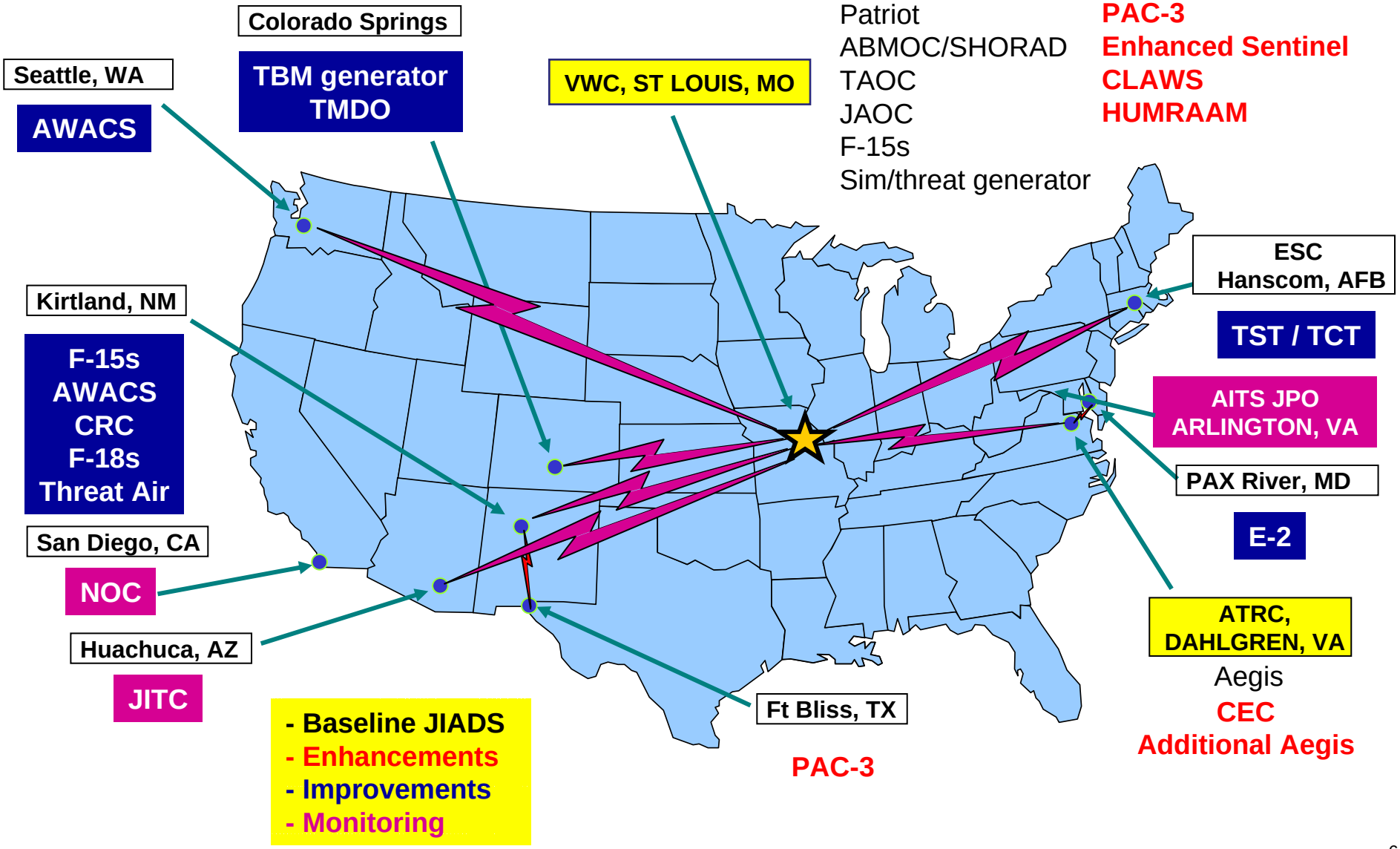
M&S Objectives

Expand JIADS CMD assessment beyond field test environment

- **Evaluate impacts to JIADS CMD effectiveness**
  - Changes to threat density and composition
  - Changes to CONOPS and TTP
  - Alternative JIADS configurations

- **Provide methodology and infrastructure to assess effectiveness of future JIADS systems/procedures against cruise missiles, TBMs, and other airborne threats**
  - Variable threats
  - O-Plan based scenario
  - Comprehensive blue force structure

ST-2 JDEP/NDEP Architecture



Simulation Test-2
Operation Open Passage II

JCMD prepared for ST as a joint military operation

- **Focus was on the continued evaluation of JIADS CMD capability**
- **ST event implemented an Operator-in-the-Loop distributed simulated JIADS**
- **Qualified operators from the operational community manned the individual Service systems and staffed the BM positions**
- **JCMD conducted a series of air defense planning conferences leading to Operation Open Passage**
- **Encompassed CMD mission tasks from defense design through prosecution of the CM threat**

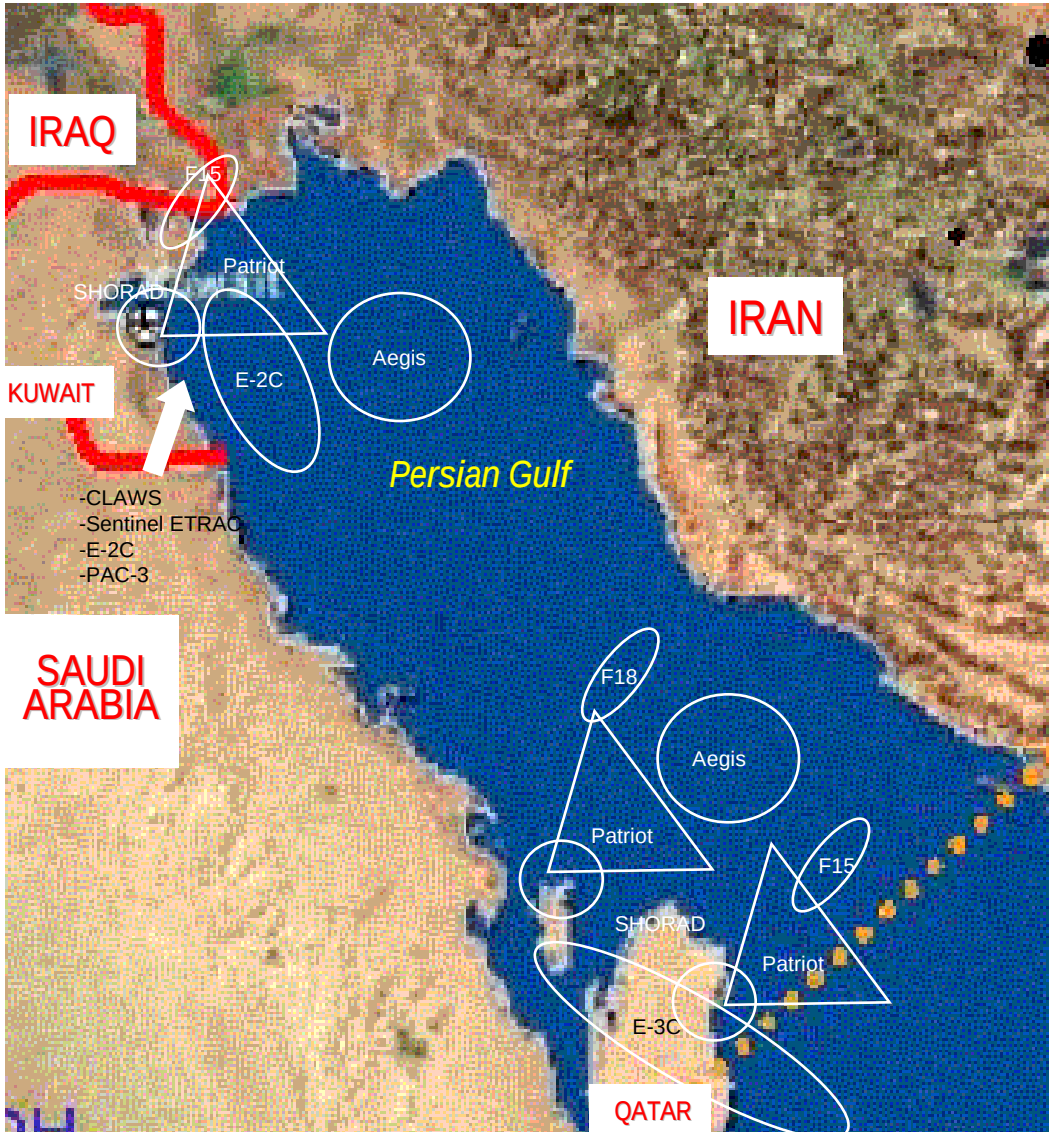
Implemented Area Air Defense Plan, asset locations, C2 Relationships/ Duties, Engagement Procedures, MEZ / FEZ / JEZ, ACMs, required reports, Air Tasking Order / Airspace Control Order, SPINS, OPTASKLINK

Planning Conferences

- **3 Conferences Planned for each ST**
  - Initial ~ 1 year prior
  - Mid ~ 6-8 months prior
  - Final ~ 2-3 months prior

- **Purpose**
  - Mission Analysis and Defense design
  - CONOPS and TTP definitions
  - Detailed operator input for simulation planning
  - Simulation Validation
  - Integration testing

ST-2 Scenario



- Bahrain area similar to ST-1
- JIADS enhancements in Kuwait area

RED THREAT

Red missile boats (ASCMs only)

Red fighters

- MIG-29
- SU-24
- F-4E
- F-5/F-7

Red SAMs

Small scale Red helo attacks

Semi-coordinated attacks

BLUE ASSETS

Blue strike fighters / RTF aircraft

Blue CMs

(Tomahawks) possible

Blue UAVs will play

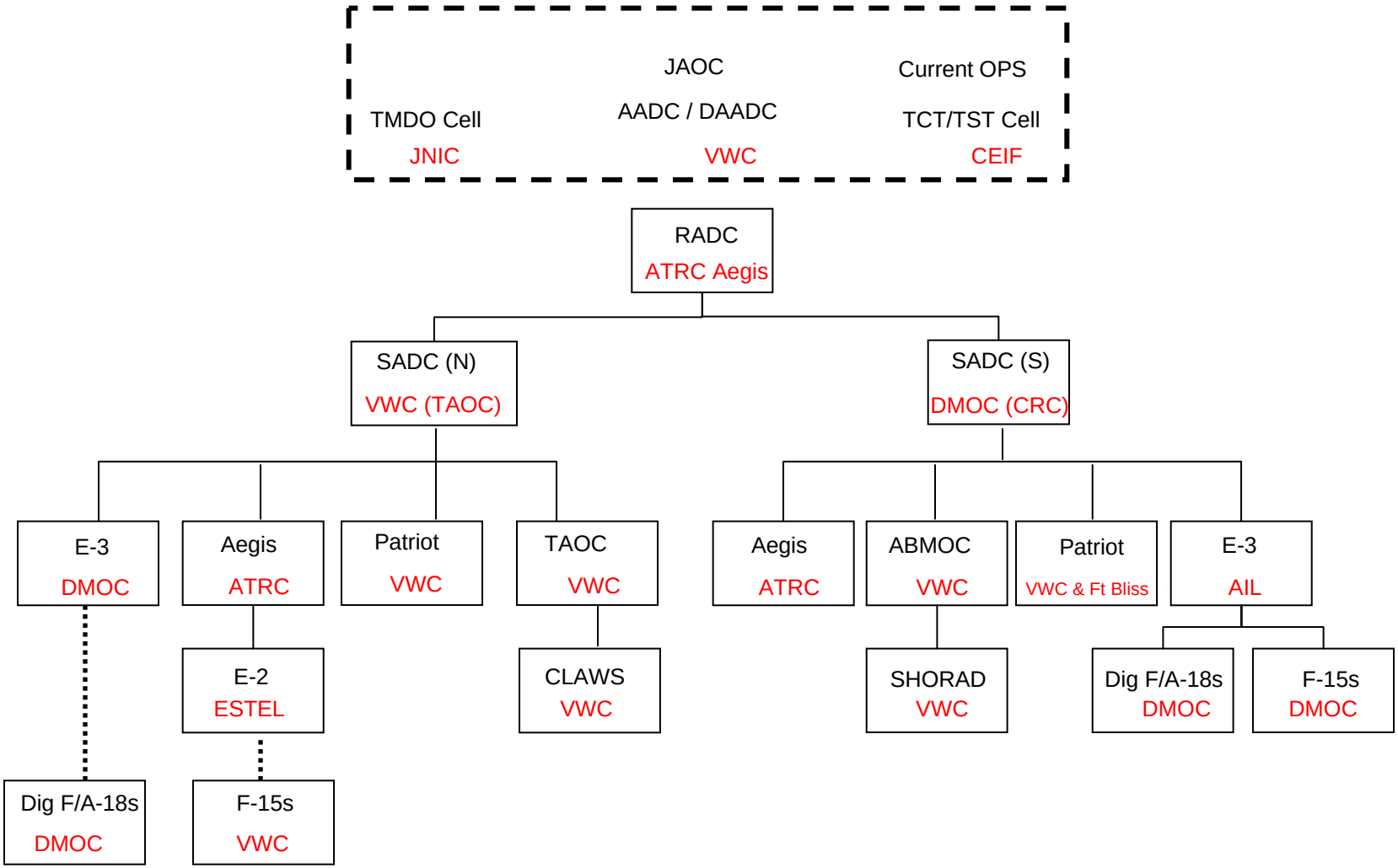
Additional Blue ships,

e.g., minesweepers & frigates

Other neutral ships,

e.g., cargo & oil tankers

ST-2 C2 Architecture



JIADS Simulation Features

- Typical U.S. sensors, shooters, BMC2 systems comprising a JIADS with Link-16 connectivity implemented via Simple-J
- Robust OPFOR providing integrated air and missile defense environment
- 16 Digital Voice Channels
- 300 km lane with 300 high-fidelity air bodies, 2 AORs
- Out of window visuals
- Terrain masking
- White Cell comms at sites to enhance realism - Coordinated Use of Electronic Support, Digi Blue Fighter Coordination, Intel injects, Navy Queries and Warning
- Mission briefs/debriefs via VTC – Events of Interest captured for coordinated After Action Review
- Exportable JIADS and system-level data recording and playback

Testing and Training Venues

- **A live venue does not currently exist that allows LACM testing and training against an operationally representative JIADS**
  - Complex system of systems – net centric operations
  - Air and Missile Defense Joint Tactical Task testing, training, and experimentation
- **Simulation events can complement live venues to overcome some deficiencies**
  - ST-2 provided 1055 cruise missile sorties without real-world airspace restrictions
  - Simulation events using Operator-in-the-Loop and Hardware-in-the-Loop are effective venues for testing and training the joint Battle Management TTPs and CONOPS required to achieve interoperability

For More Information
Please Contact:

Office of the Secretary of Defense
Joint Cruise Missile Defense
207 West D. Avenue, Suite 128
Eglin Air Force Base, FL 32542
001 (850) 882-4661 or DSN 872-4661

Col Bill Holway, USAF, Director
william.holway@eglin.af.mil (850) 882-4661 ext 100
Mrs. Geri Lentz, DAFC, Technical Director
geri.lentz@eglin.af.mil (850) 882-4661 ext 108

JCMD Lessons Learned (1 of 9)

- **Administrative issues were more painful than the technical problems**
  - 8 Operator Nodes, 2 Monitoring Nodes
    - **Security Accreditation Packages**
      - Network Drawings
      - PL 1 vs PL 2
      - LINUX waiver
      - ATC/ATO
      - DAA/DSS Approval
    - **MOA**
    - **POA&M**
    - **Test Plans**
    - **Configuration Management**
- **Administrative issues are crucial to program success**
  - Require early and continuous monitoring
  - May warrant dedicated sub working group for security

JCMD Lessons Learned (2 of 9)

- **JCMD timeline caused network "reverse engineering"**
  - Success of ST-1 generated interest from Services and sites to participate in ST-2
  - Funding not available for expanded architecture causing uncertainty of nodes, configurations, and participants
  - Resulted in some site integration issues being worked during test periods
- **Would not have been successful without the hard work and dedication of everyone**
  - JITC, IATS JPO, NOC
  - Participant sites – VWC, ATRC, DMOC, JNIC, ESTEL, CEIF, AIL, Ft Bliss

JCMD Lessons Learned (3 of 9)

- **Operational testing/training in a distributed Joint simulation environment drives the requirement for high fidelity VTC capability**
  - Mission debriefings, events of interest, and after action reviews (AARs) provide critical test data
  - JCMD current configuration includes equipment available at the various nodes – not a formally planned and procured capability
  - Hardware and software incompatibilities
- **Workaround is not ideal, but should suffice**
  - JCMD will push .avi files to remote sites
  - Sites will replay files on local computers and start and stop on verbal direction from JCMD during AARs
  - Sites will follow JCMD-defined VTC procedures to ensure orderly discussion and coordination
  - JCMD records all VTC sessions for replay and analysis

JCMD Lessons Learned (4 of 9)

- **Proof of concept for portable JDEP node - Ft Bliss Warfighting Center**
  - **Provided required capability**
  - **Accomplished very quickly**
  - **Less expensive than full JDEP installation, but for single or short term event participation**
- **JITC/AITS JPO success story**
- **This capability greatly benefits the JCMD JT&E**

JCMD Lessons Learned (5 of 9)

- **Communication**
  - Network integration and troubleshooting requires good 2-way communication
    - **Not 5, 7, 9-way communication**
    - **Test manager must clearly communicate issues and priorities**
    - **JITC/IATS JPO must respond with status and work plan**
  - JITC and JPO sent personnel to VWC during JCMD critical events which benefited all organization
    - **Allowed engineers to understand an operational test and training environment**
    - **Allowed JCMD easier access to technical expertise**

JCMD Lessons Learned (6 of 9)

- **JDEP Education**
  - The smarter the test organization, the smaller the frustration level
    - **JCMD and nodes felt some integration issues took much too long**
      - VLANS, IPs, NSAPs, ASTi programming
      - STU phone access
        - » All sites did not initially provide, which hindered problem resolution
    - **Various equipment issues**
      - Number of MAC addresses allowed, routers, switches, encryption, Verizon P-3 card, power supply, Sphere phone hub failures, loopback problem, FASTLANE battery
  - Greater understanding in the planning phase would allow test organization to mitigate some areas of risk

JCMD Lessons Learned (7 of 9)

- **Application Level Integration**
  - TIMs critical to understand capabilities and limitations
  - Stable network required before the simulation integration issues can be addressed
  - Integration in a different environment and scenario allowed discovery of simulation problems and subsequent fixes
    - **High fidelity vs Robustness**
    - **Operator face validation**
    - **Entity flight path and position/orientation data**
  - DIS
    - **Enumerations**
    - **Kill and detonate PDUs**
    - **Signal and emitter PDUs**
  - Bandwidth and Latency

JCMD Lessons Learned (8 of 9)

- **DIS vs HLA**
  - JCMD made the right decision to implement the OITL simulated JIADS in a DIS environment
    - **Test milestones could not be changed to provide longer timeline**
    - **No funding (or time) for legacy simulation conversions**
    - **Gateway implementation of HLA too risky compared to amount of simulation integration issues**
    - **RTIs could not support real time operation for number of bodies and update rates in a high threat air environment**
  - JITC initiated a parallel study with JCMD ST-2
    - **Model ST-2 environment to determine HLA implementation impact**
    - **JCMD provided updated data to JITC at the FPC**

JCMD Lessons Learned (9 of 9)

- **Network Capabilities Roadmap**
  - Large number of networks/architectures and number is increasing
    - **Is there oversight and a roadmap?**
    - **Will networks be interoperable?**
    - **Where does a user go to gain understanding of current capability?**
    - **Are networks being designed to fill gaps in current capability?**
    - **Redundancy may be necessary for scheduling requirements, but is this conscious planning underway?**
  - No clear picture emerging from a user perspective

Node Status as of 1700 (Central)

16 Jan 04

Site	VTC	Sphere	Conf Sphere	DIS	Simple J	ASTi	CEC
VWC	X	X	X	X	X	X	N/A
ATRC	X	X	X	X	X	X	X
ESTEL	X	X	X	X	X	X	X
JNIC	X	X	X	X	N/A	X	N/A
DMOC	X	X	X	X	X	X	N/A
AIL	X	X	X	X	X	X	N/A
CEIF	X	X	X	X	X	X	N/A
Ft Bliss	X	X	X	X	X	X	N/A
JITC	X	X	X	N/A	N/A	X	N/A
Navy NOC	N/A	X	X	N/A	N/A	N/A	N/A

Key

X **Validated**

↑ **Operational – not validated**

↓ **Down**

N/A Not Applicable

Know the Earth…Show the Way

Geospatial-Intelligence: Providing The Foundation for Net-Centric Operations

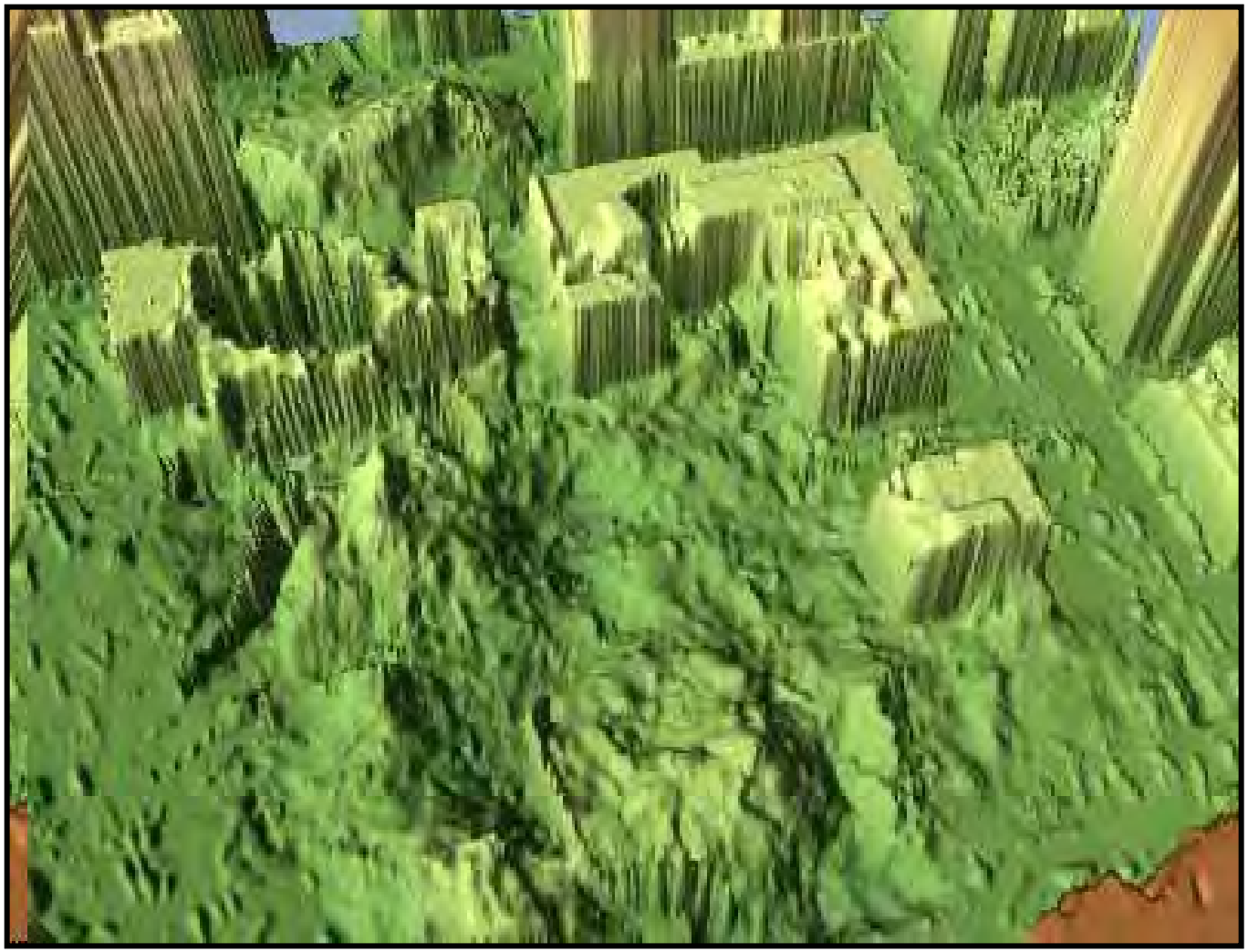
22 March 2005

Mr. Keith J. Masback (Bob Gajda)
Deputy Director, Office of Strategic Transformation

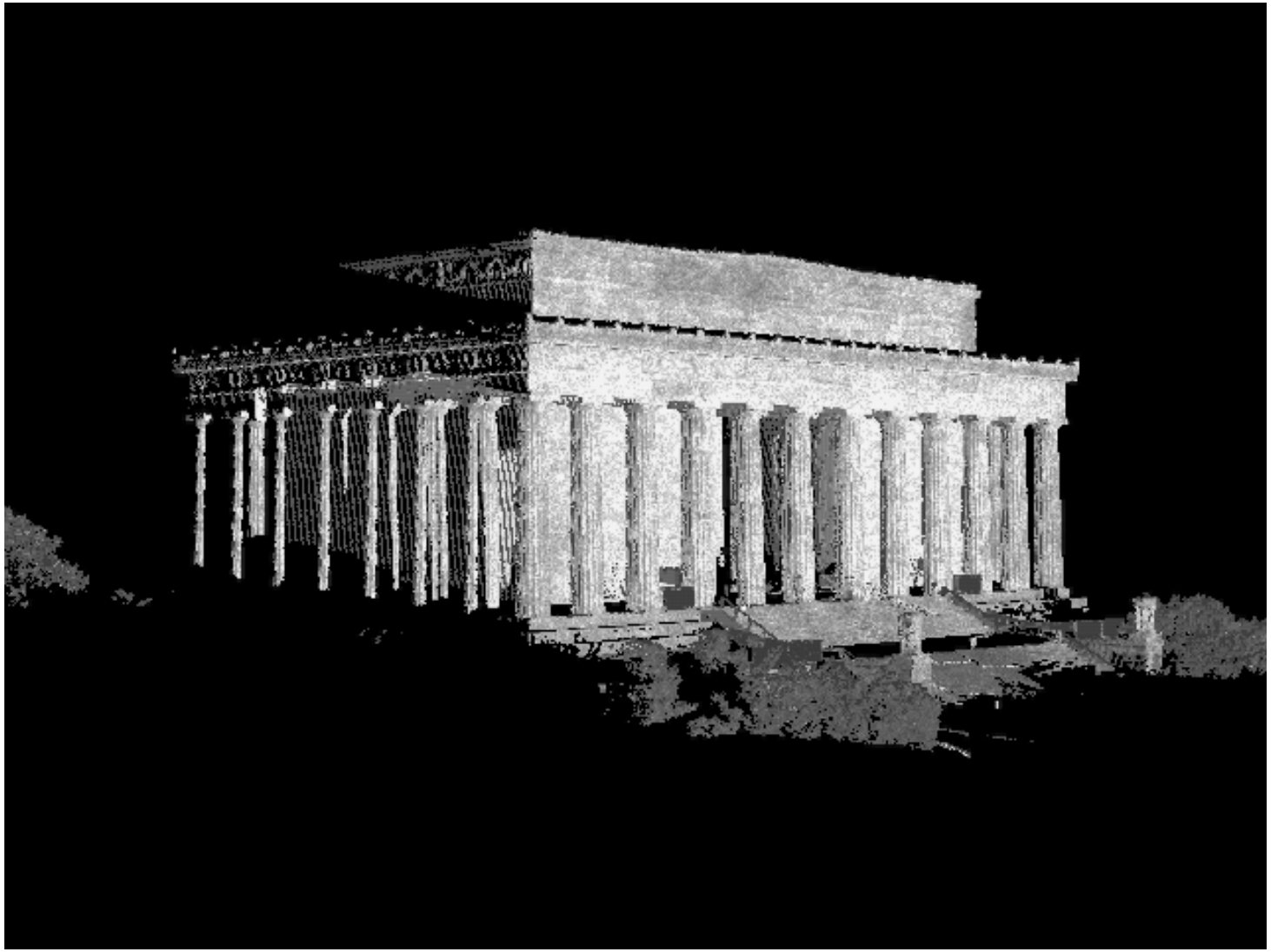
The ability of systems, units or forces to provide services to/and accept services from other systems, units or forces and use the services to enable them to operate effectively together.

Joint Chiefs of Staff Publication 1.02

Ground Zero - Post September 11, 2001 LIDAR



16th President -- LIDAR



NGA /GEOINT

HI/GKB/GEOSCOUT

Morpheus

FFD/DPPDb/CIB/DNC/DVOF

FCS/JSF/F-22/SDB/SDV/DCGS

NCGIS/GWG/MSEA-TX

NGA /GEOINT

HI/GKB/GEOSCOUT

Morpheus

FFD/DPPDb/CIB/DNC/DVOF

FCS/JSF/F-22/SDB/SDV/DCGS

NCGIS/GWG/MSEA-TX

J9 Net Centric Support to CENTCOM

Net Centric Operations, Interoperability & Systems Integration Conference
24 Mar 05

MAJ Ed McLarney
USJFCOM/J9

Situation

- Multinational Forces-Iraq (MNF-I) Information Technology division frustrated with on-hand information sharing technology
  - Disparate data sources
  - Proprietary, non-interoperable tools
- Iraqi Interim Government (IIG) network to be stood-up in next several months
  - Capability will crawl, walk, run
  - Need to share data from MNF-I with IIG
- MNF-I requests JFCOM help – Nov 04

Mission

- **Mission:** NLT 30 Jan 2005, JFCOM delivers and configures a user-friendly and largely open-standards / open-source portal, document management, and chat capability to MNF-I to enhance information-sharing, position MNF-I for interoperability with future systems, and enable near-term air-gap data sharing with the Iraqi Interim Government network

- **Endstate:** Open-standards systems used as the primary MNF-I information sharing medium NLT 30 March 05, leading to air-gap data sharing with IIG

Vision

- Customer: Seamless information sharing among all US and coalition partners, to include the upcoming IIG network. This effort is the first step toward that end.
- Joint Prototype Pathway:
  - Provide warfighter benefit NOW
  - Promote interoperability and transformation to Net-Centricity and Web-Services by delivering and supporting near-term robust, non-proprietary, standards-based capability directly to the warfighter

Timeline

- Oct 04 AO initial coordination
- Nov 04 Formal MNFI request to JFCOM
- Jan 05 Finish Dev & Test
- End Jan Deploy
- Feb Install / Debug
- March Support & enhance

Portal Requirements from MNFI

- Secure and rapid cross-domain replication w/IIG
  - Unclas only first until Policy changes in place
- Built to open standards as much as possible
- Scaleable up to 5,000 users
- Integrate existing applications and databases
- Use standard ports/protocols
- Login tied to Active Directory for Single Sign On
- User configures preferences in portal profile
- Ability to configure based on roles, user groups
- Ability to collect metrics on performance & usage
- Centralize user functions (Collaborative Tools, Search etc.)

Tasks

- Provide portal, document management, text chat, and web-based common operational picture (COP)
- As much open standards & open source as possible
- Air gap replication of data to emerging Iraqi Interim Government (IIG) network
- Integrated search capability
- Seamless user experience
- Primary and backup sites

Technology Choices

- Portal: eXo; open standards; open source
- Document Management: Xythos: open standards; low cost
- Text Chat / Instant Messaging: Buddyspace; open standards; open source
- WebCOP: SPAWAR WebCOP: open standards
- Database: Oracle; industry standard

Open Standards

- Improve Interoperability
- Code Reuse
- Development Community

- Open Standards for J9 Prototypes:
  - JSR 168 -Open Source Java Portlet Specification
  - WSRP- Web Services for Remote Portals
  - XMPP- Extensible Messaging Presence Protocol
  - XML- eXtensible Markup Language for data tagging
  - SOAP- Simple Object Access Protocol messaging protocol to move XML
  - WSDL- Web Service Description Language
  - UDDI- Universal Description Discovery Integration

- J9's requirement is software packages that demonstrate how THEY interoperate with other software in an open standards framework
- Stating other software can interoperate with you is not sufficient…
  - Must demonstrate ability to interoperate
  - Must use proactive stance… If two pieces of SW do not interoperate, we expect both vendors to work the solution from the ends to the middle
  - Interoperability is not "the other guy's problem"

Unclassified

Way Ahead

- Support & maintain
- Air-gap installation
- Cross domain demo (Multinational Information Sharing demo)
- National Security Agency Certification, Test & Evaluation of cross domain
- Install cross domain

Experience with Industry

- Industry support was exceptional, both from traditional vendors and open source community
- THANK YOU
- Solutions that religiously adhered to open standards…
  - Provided solid capability that met immediate customer requirements
  - Set stage for moving toward Net-Centricity

Challenges for Industry

- Make your software interoperate with others' IAW emerging open standards
- Multi-way standards-compliant database replication that works in connected and disconnected modes
- Bulletproof Active Directory (or similar) capability that works so seamlessly we don't have to worry about it… focus on emerging technology instead
- Robust gallery of Java Specification Request (JSR) 168-compliant portlets for most standard business processes; No proprietary extensions
- Applications capable of binding classification and release information to files and data elements in preparation for traversing a cross-domain XML guard
- Services-Oriented Architecture services NOW instead of in several years
- Continued support like we received in this mission

Net-Centric ISR

Kevin Meiners

Office of the Under Secretary of Defense for Intelligence

NDIA Conference

22 Mar 2005

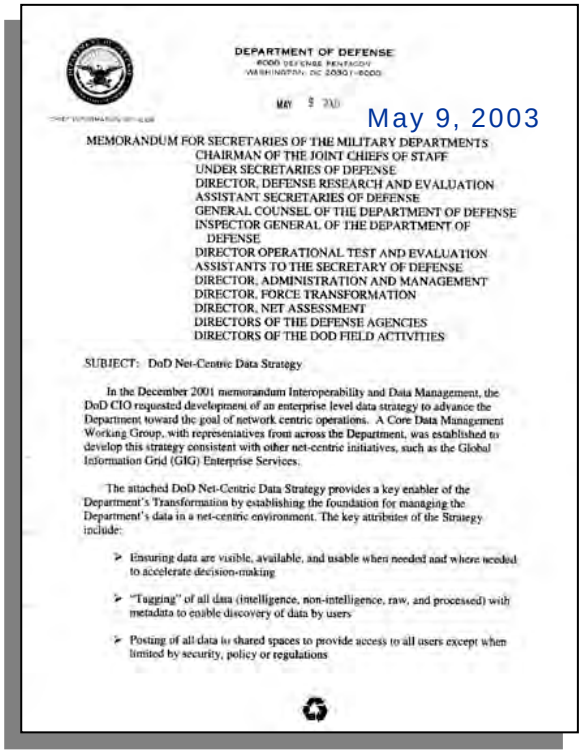
Agenda

- **Net–Centric Policy and Governance**
- **Distributed Common Ground Systems**

DoD Net-Centric DATA Strategy

- **Signed out May 9, 2003**
- **Key Attributes**
  - Ensuring Data Are Visible, Available, and Usable
  - "Tagging" of all Data with Metadata to Enable Discovery
  - Posting of Data to Shared Spaces to Provide Access

"DoD Data Strategy"



DEPARTMENT OF DEFENSE

MAY 9 2003

May 9, 2003

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
DIRECTOR, DEFENSE RESEARCH AND EVALUATION
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
DIRECTOR OPERATIONAL TEST AND EVALUATION
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTOR, FORCE TRANSFORMATION
DIRECTOR, NET ASSESSMENT
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: DoD Net-Centric Data Strategy

In the December 2001 memorandum Interoperability and Data Management, the DoD CIO requested development of an enterprise level data strategy to advance the Department toward the goal of network centric operations. A Core Data Management Working Group, with representatives from across the Department, was established to develop this strategy consistent with other net-centric initiatives, such as the Global Information Grid (GIG) Enterprise Services.

The attached DoD Net-Centric Data Strategy provides a key enabler of the Department's Transformation by establishing the foundation for managing the Department's data in a net-centric environment. The key attributes of the Strategy include:

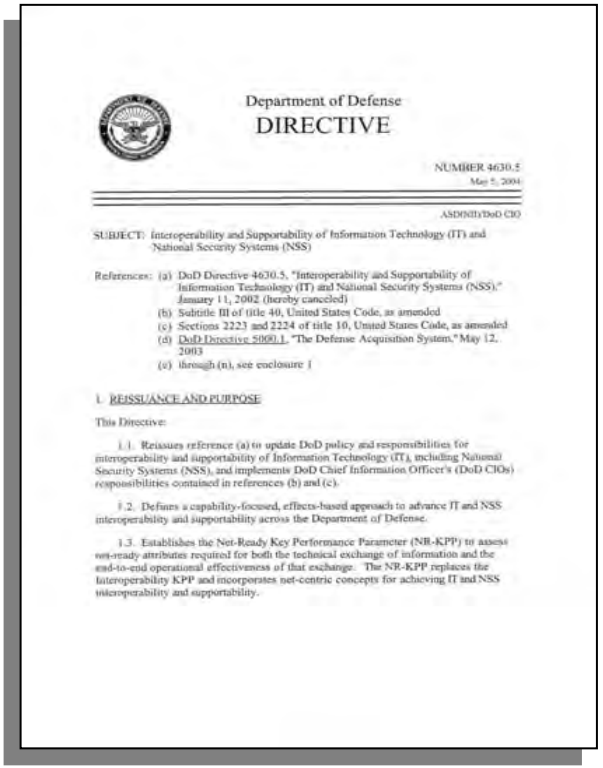
- Ensuring data are visible, available, and usable when needed and where needed to accelerate decision-making
- "Tagging" of all data (intelligence, non-intelligence, raw, and processed) with metadata to enable discovery of data by users
- Posting of all data to shared spaces to provide access to all users except when limited by security, policy or regulations

Google Search: " DoD Data Strategy "

Joint Staff NR-KPP Guide

- **New Key Performance Parameter: Net-Ready KPP**
- **Net-Ready KPP used in lieu of the Interoperability KPP**
- **Other NR-KPP Guidance Docs:**
  - **DoDI 4630.8** (Implements NR Policy)
  - **JROCM 236-03** (Replaces IER & I-KPPs)
  - **CJCSI 3170.01D** (JCIDS Procedures)
  - **CJCSI 6212.01C** (Required for IT Systems)

"DoDD 4630.5"



Department of Defense
DIRECTIVE

NUMBER 4630.5
May 5, 2004

ASD(NII)/DoD CIO

SUBJECT: Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)

References: (a) DoD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," January 11, 2002 (hereby canceled)
(b) Subtitle III of title 40, United States Code, as amended
(c) Sections 2223 and 2224 of title 10, United States Code, as amended
(d) DoD Directive 5000.1, "The Defense Acquisition System," May 12, 2003
(e) through (n), see enclosure 1

1. REISSUANCE AND PURPOSE

This Directive:

1.1. Reissues reference (a) to update DoD policy and responsibilities for interoperability and supportability of Information Technology (IT), including National Security Systems (NSS), and implements DoD Chief Information Officer's (DoD CIOs) responsibilities contained in references (b) and (c).

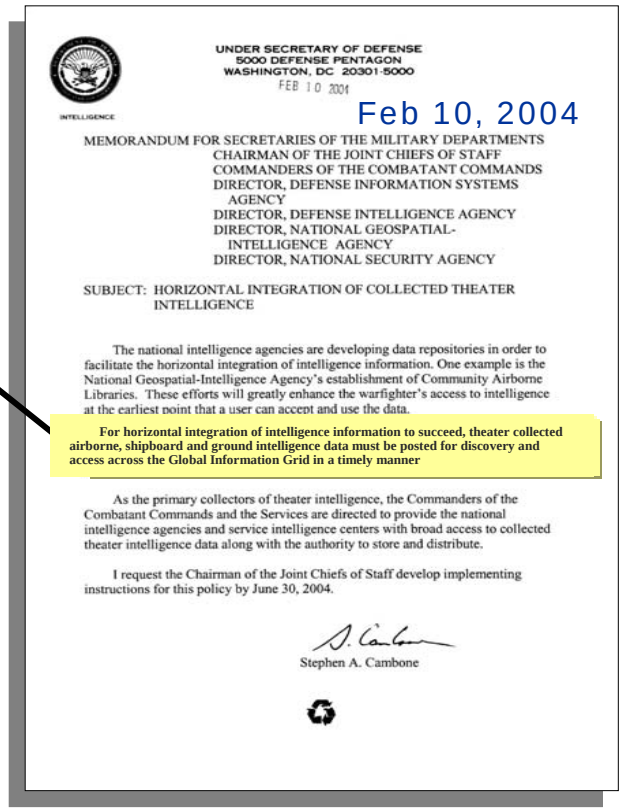
1.2. Defines a capability-focused, effects-based approach to advance IT and NSS interoperability and supportability across the Department of Defense.

1.3. Establishes the Net-Ready Key Performance Parameter (NR-KPP) to assess net-ready attributes required for both the technical exchange of information and the end-to-end operational effectiveness of that exchange. The NR-KPP replaces the Interoperability KPP and incorporates net-centric concepts for achieving IT and NSS interoperability and supportability.

Horizontal Integration

- **USD(I) Policy - Feb 10, 2004**
- **"For horizontal integration of intelligence information to succeed, theater collected airborne, shipboard and ground intelligence data must be posted for discovery and access across the Global Information Grid in a timely manner"**
- **Joint Staff Implementation Instructions to be published by 30 Jun 04**

"Horizontal Integration of Collected Theater Intel"



UNDER SECRETARY OF DEFENSE
5000 DEFENSE PENTAGON
WASHINGTON, DC 20301-5000

FEB 10 2004

INTELLIGENCE

Feb 10, 2004

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
COMMANDERS OF THE COMBATANT COMMANDS
DIRECTOR, DEFENSE INFORMATION SYSTEMS AGENCY
DIRECTOR, DEFENSE INTELLIGENCE AGENCY
DIRECTOR, NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY
DIRECTOR, NATIONAL SECURITY AGENCY

SUBJECT: HORIZONTAL INTEGRATION OF COLLECTED THEATER INTELLIGENCE

The national intelligence agencies are developing data repositories in order to facilitate the horizontal integration of intelligence information. One example is the National Geospatial-Intelligence Agency's establishment of Community Airborne Libraries. These efforts will greatly enhance the warfighter's access to intelligence at the earliest point that a user can accept and use the data.

For horizontal integration of intelligence information to succeed, theater collected airborne, shipboard and ground intelligence data must be posted for discovery and access across the Global Information Grid in a timely manner

As the primary collectors of theater intelligence, the Commanders of the Combatant Commands and the Services are directed to provide the national intelligence agencies and service intelligence centers with broad access to collected theater intelligence data along with the authority to store and distribute.

I request the Chairman of the Joint Chiefs of Staff develop implementing instructions for this policy by June 30, 2004.

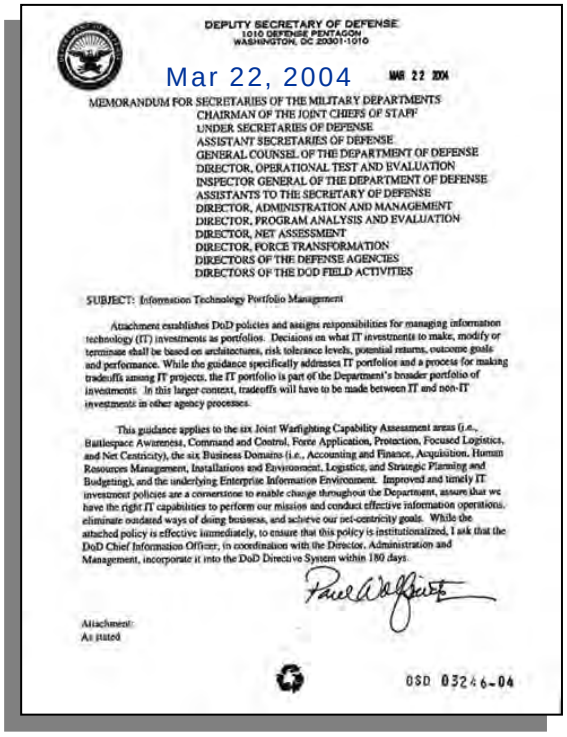
Stephen A. Cambone

Access – Access – Access

DEPSECDEF - IT Portfolio MGMT

- **Portfolio Mgmt vice Program Mgmt**
- **Three Mission Areas**
  - Business
  - Warfighting
  - Enterprise Info Environment
- **Domains are Designated within Mission Areas**
- **Communities of Interests (COIs) are Formed within a Domain**

"IT Portfolio Mgmt"



DEPUTY SECRETARY OF DEFENSE
1010 DEFENSE PENTAGON
WASHINGTON, DC 20301-1010

Mar 22, 2004

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
DIRECTOR, OPERATIONAL TEST AND EVALUATION
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTOR, PROGRAM ANALYSIS AND EVALUATION
DIRECTOR, NET ASSESSMENT
DIRECTOR, FORCE TRANSFORMATION
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Information Technology Portfolio Management

Attachment establishes DoD policies and assigns responsibilities for managing information technology (IT) investments as portfolios. Decisions on what IT investments to make, modify or terminate shall be based on architectures, risk tolerance levels, potential returns, outcome goals and performance. While the guidance specifically addresses IT portfolios and a process for making tradeoffs among IT projects, the IT portfolio is part of the Department's broader portfolio of investments. In this larger context, tradeoffs will have to be made between IT and non-IT investments in other agency processes.

This guidance applies to the six Joint Warfighting Capability Assessment areas (i.e., Battlespace Awareness, Command and Control, Force Application, Protection, Focused Logistics, and Net Centricity), the six Business Domains (i.e., Accounting and Finance, Acquisition, Human Resources Management, Installations and Environment, Logistics, and Strategic Planning and Budgeting), and the underlying Enterprise Information Environment. Improved and timely IT investment policies are a cornerstone to enable change throughout the Department, assure that we have the right IT capabilities to perform our mission and conduct effective information operations, eliminate outdated ways of doing business, and achieve our net-centricity goals. While the attached policy is effective immediately, to ensure that this policy is institutionalized, I ask that the DoD Chief Information Officer, in coordination with the Director, Administration and Management, incorporate it into the DoD Directive System within 180 days.

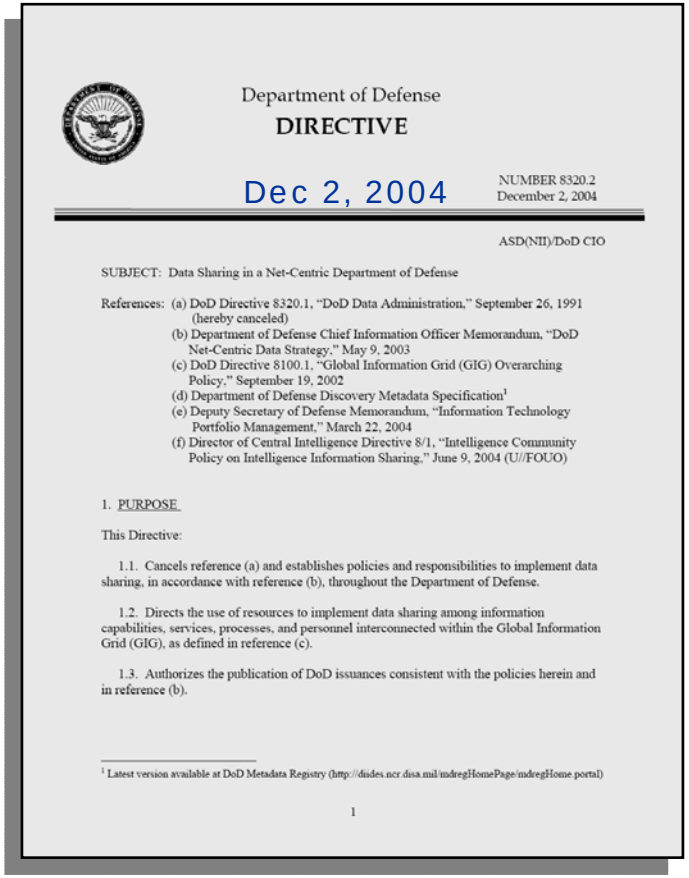
Attachment:
As stated

OSD 03246-04

Intelligence – Emerging as 4th MA

DODD 8320.2 - Data Sharing in a Net-Centric DOD

- **Under Secretary of Defense For Intelligence shall:**
  - With DoD CIO, USD(P), and IC CIO, develop policies and procedures to protect Net-Centric data while enabling data sharing across different security classifications and between the DOD, the IC, and multinational partners, IAW with policies consistent with DCID 8/1.
  - Ensure that Defense Intelligence Activities within the **National Intelligence Mission Area** promote Net-Centric data sharing and effectively enable COIs, adjudicating conflicts in metadata agreements and identifying authoritative sources.
  - Ensure CI and security support to network-centric operations.



Department of Defense
DIRECTIVE

Dec 2, 2004

NUMBER 8320.2
December 2, 2004

ASD(NII)/DoD CIO

SUBJECT: Data Sharing in a Net-Centric Department of Defense

References: (a) DoD Directive 8320.1, "DoD Data Administration," September 26, 1991 (hereby canceled)
(b) Department of Defense Chief Information Officer Memorandum, "DoD Net-Centric Data Strategy," May 9, 2003
(c) DoD Directive 8100.1, "Global Information Grid (GIG) Overarching Policy," September 19, 2002
(d) Department of Defense Discovery Metadata Specification[1]
(e) Deputy Secretary of Defense Memorandum, "Information Technology Portfolio Management," March 22, 2004
(f) Director of Central Intelligence Directive 8/1, "Intelligence Community Policy on Intelligence Information Sharing," June 9, 2004 (U//FOUO)

1. PURPOSE

This Directive:

1.1. Cancels reference (a) and establishes policies and responsibilities to implement data sharing, in accordance with reference (b), throughout the Department of Defense.

1.2. Directs the use of resources to implement data sharing among information capabilities, services, processes, and personnel interconnected within the Global Information Grid (GIG), as defined in reference (c).

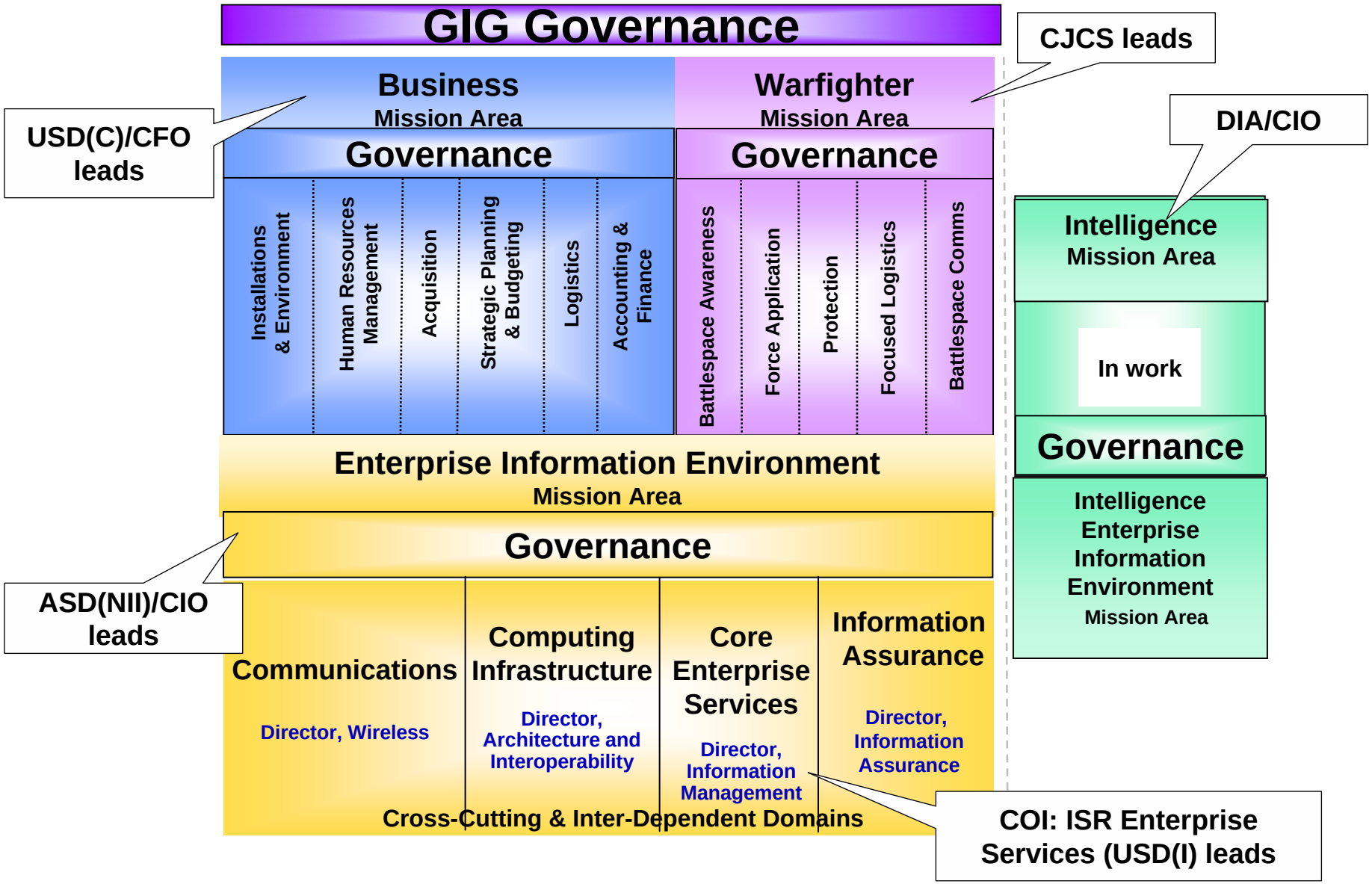
1.3. Authorizes the publication of DoD issuances consistent with the policies herein and in reference (b).

[1] Latest version available at DoD Metadata Registry (http://diides.ncr.disa.mil/mdregHomePage/mdregHome.portal)

1

Expands on 22 Mar 04 DEPSECDEF memo

DoD Portfolios and Related National Intelligence Portfolios



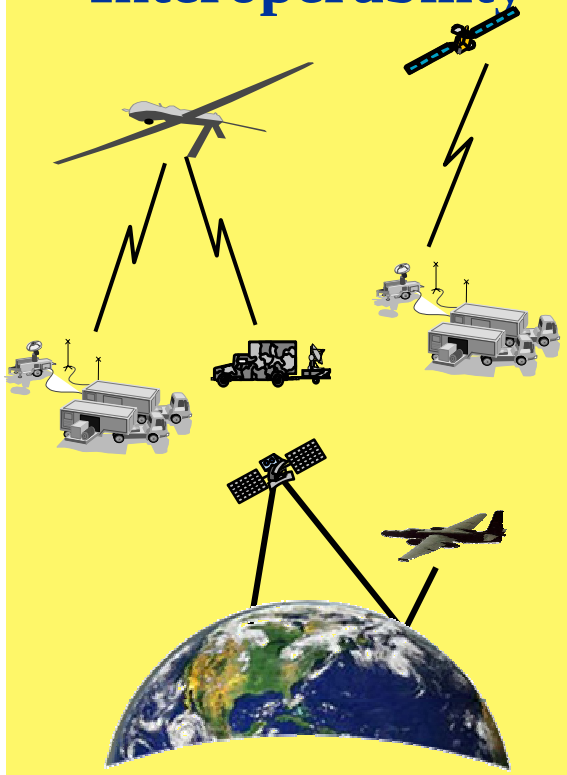
Agenda

- Net–Centric Policy and Governance

- **Distributed Common Ground Systems**

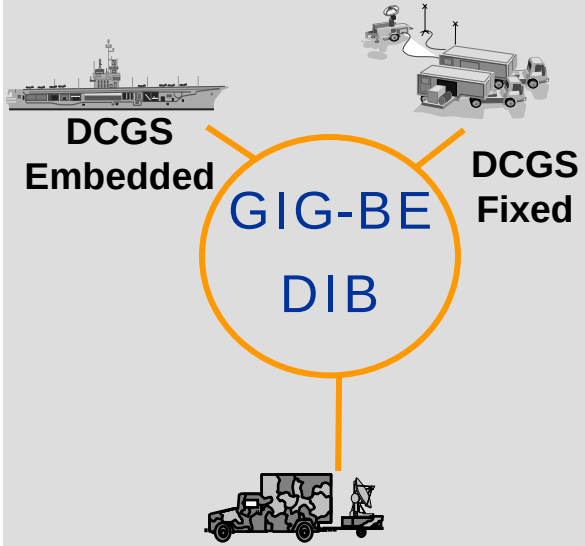
Distributed Common Ground/Surface Systems (DCGS)

DCGS Today "Interoperability



"AS IS"
2000-04

DoD-DCGS "Net-Centric"



Transition
2004-06

ISR "Enterprise"

"TO BE"
2006-11

Service DCGS Elements

DCGS – A

- Common Ground Station (CGS)
- Integrated Processing Facility (IPF)
- Guardrail Information Node (GRIFN)
- All Source Analysis System (ASAS)
- Counter intelligence/Human Intelligence Information Management Systems (CHIMS)
- Home Station Operations Center (HSOC)
- Tactical Exploitation Systems (TES)

DCGS – MC

- Common Ground Station (CGS)
- Intelligence Analysis System (IAS)
- Technical Control and Analysis Center (TCAC)
- Tactical Exploitation Group (TEG)

DCGS - N

- Battle Group Passive Horizon Extension System (BGHPHES)
- Combat Direction Finding Systems (CDF)
- Global Command and Control System-Maritime/Integrated intelligence Information (GCCS-M/I3)
- Joint Service Imagery Processing Systems – Naval (JSIPS-N)
- Ships Signal Exploitation Equipment (SSEE)
- UAV Tactical Control System (UAV TCS)
- JSIPS Concentrator Architecture (JCA)
- Tactical Exploitation Systems – Naval (TES-N)

DCGS - AF

- Deployable Ground Intercept Facility (DGIF)
- Deployable Shelterized Systems (DSS)
- Deployable Transit-Cased Systems (DTS)
- Ground Control Processor (GCP)
- Main Operating Locations
  - DGS-1 Beale AFB, CA
  - DGS-2 Langley AFB, VA
  - DGS-3 KCOIC Osan Korea
  - DGS-4 Ramstein AB, GE
  - Plus 17 remote locations
- ISR Management/C2 of ISR
  - ISRM, ISRW, Remote CSP
- MOBSTR/Extended Tether Program (ETP)
- Wide-Area, Campus-Area, Local-Area Networks/Comms

Service DCGS Elements


TES- MAIN


CHIMS (HUMINT)


TES- FWD


CGS


GRIFN

ASAS

DCGS-A


IAS


TEG


CGS

TCAC


12 R

DCGS-MC


TES-N

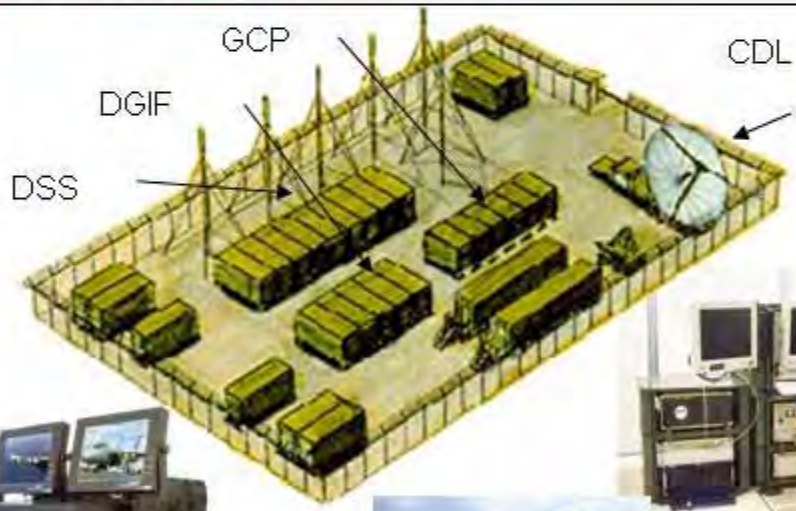

SSEE


JSIPS-N


BGPHES


MIBS

DCGS-N




DTS

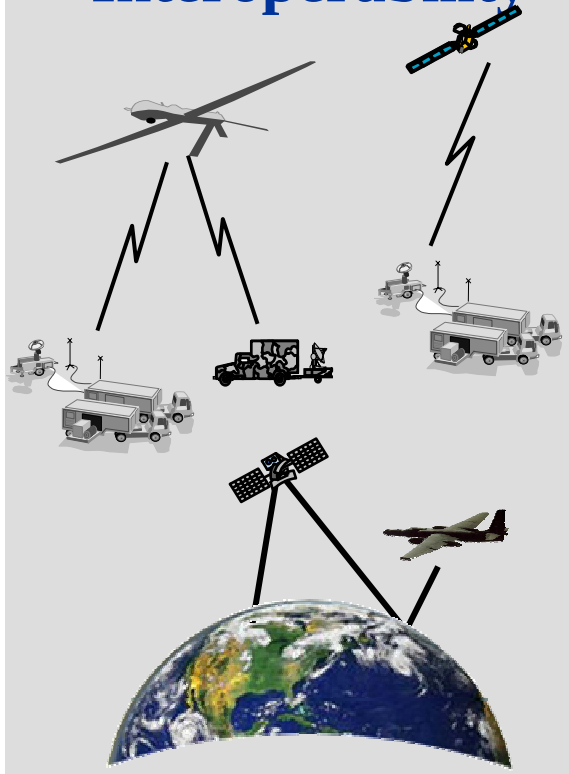

ISRM


MOBSTR

DCGS-AF

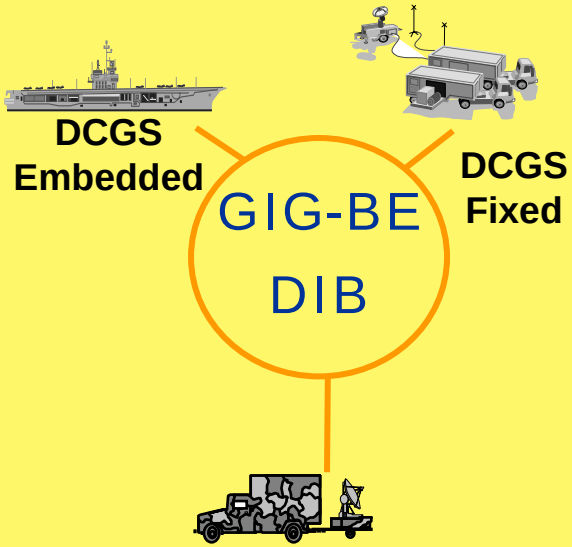
Distributed Common Ground/Surface Systems (DCGS)

DCGS Today "Interoperability



"AS IS" 2000-04

DoD-DCGS "Net-Centric"



Transition 2004-06

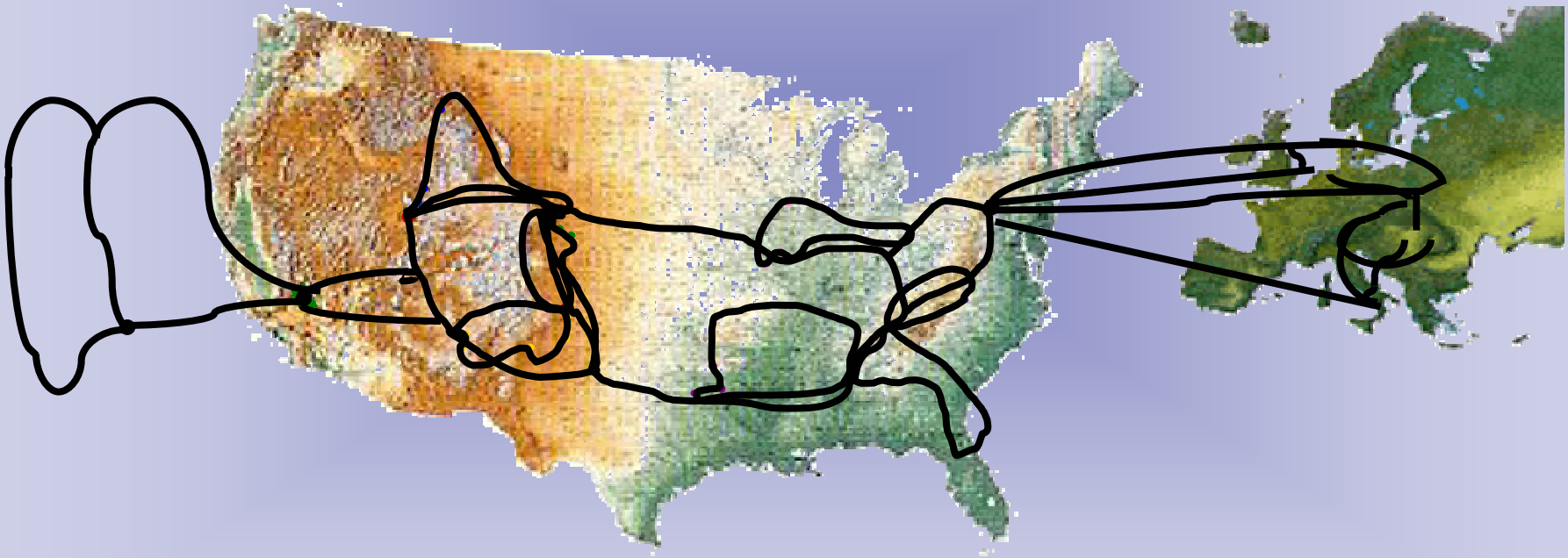
ISR "Enterprise"

"TO BE" 2006-11

Global Information Grid - Bandwidth Expansion

Part of the Global Information Grid

- **Ubiquitous, secure, robust optical IP foundation network**
- **CONUS & OCONUS**
- **~90% of DCGS sites are included on the GIG-BE List**
- **IOC Sep 04**
- **FOC Sep 05**

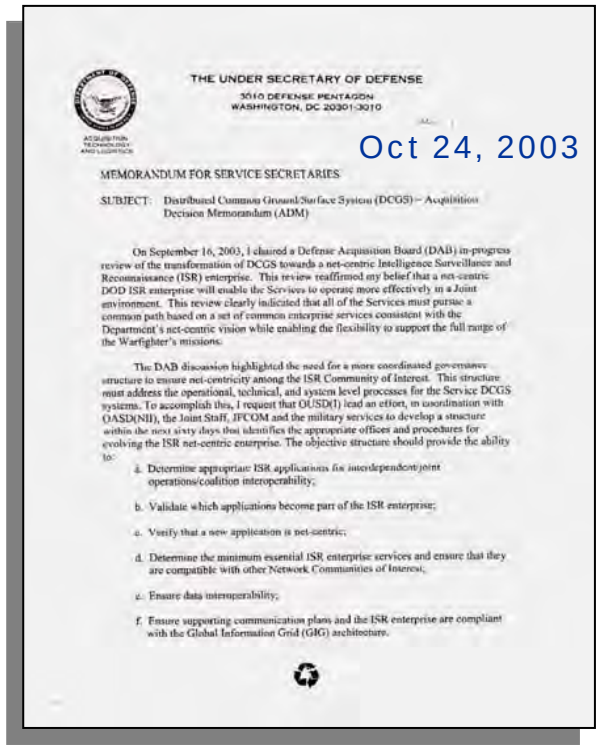


GIG BE goal: Remove bandwidth as limiting factor

Recent DCGS Interoperability Memorandum

"DCGS Acquisition Decision Memorandum"

- **Defense Acquisition Executive Authorized Air Force to proceed with DCGS 10.2 including DCGS Integration Backbone (DIB)**
- **All Services will use the DIB to achieve Net Centricity**



THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

Oct 24, 2003

MEMORANDUM FOR SERVICE SECRETARIES

SUBJECT: Distributed Common Ground/Surface System (DCGS) – Acquisition Decision Memorandum (ADM)

On September 16, 2003, I chaired a Defense Acquisition Board (DAB) in-progress review of the transformation of DCGS towards a net-centric Intelligence Surveillance and Reconnaissance (ISR) enterprise. This review reaffirmed my belief that a net-centric DOD ISR enterprise will enable the Services to operate more effectively in a Joint environment. This review clearly indicated that all of the Services must pursue a common path based on a set of common enterprise services consistent with the Department's net-centric vision while enabling the flexibility to support the full range of the Warfighter's missions.

The DAB discussion highlighted the need for a more coordinated governance structure to ensure net-centricity among the ISR Community of Interest. This structure must address the operational, technical, and system level processes for the Service DCGS systems. To accomplish this, I request that OUSD(I) lead an effort, in coordination with OASD(NII), the Joint Staff, JFCOM and the military services to develop a structure within the next sixty days that identifies the appropriate offices and procedures for evolving the ISR net-centric enterprise. The objective structure should provide the ability to:

a. Determine appropriate ISR applications for interdependent/joint operations/coalition interoperability;

b. Validate which applications become part of the ISR enterprise;

c. Verify that a new application is net-centric;

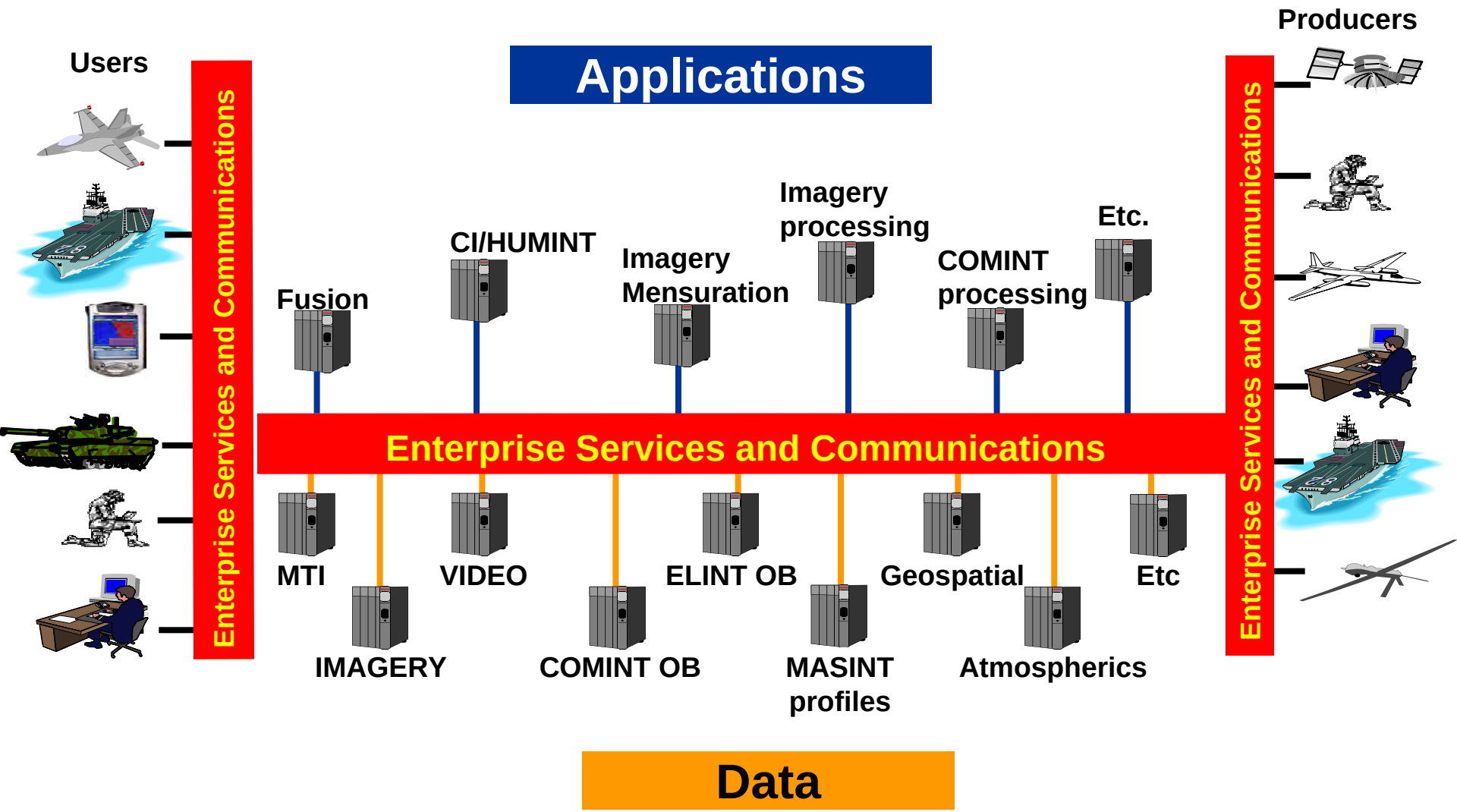
d. Determine the minimum essential ISR enterprise services and ensure that they are compatible with other Network Communities of Interest;

e. Ensure data interoperability;

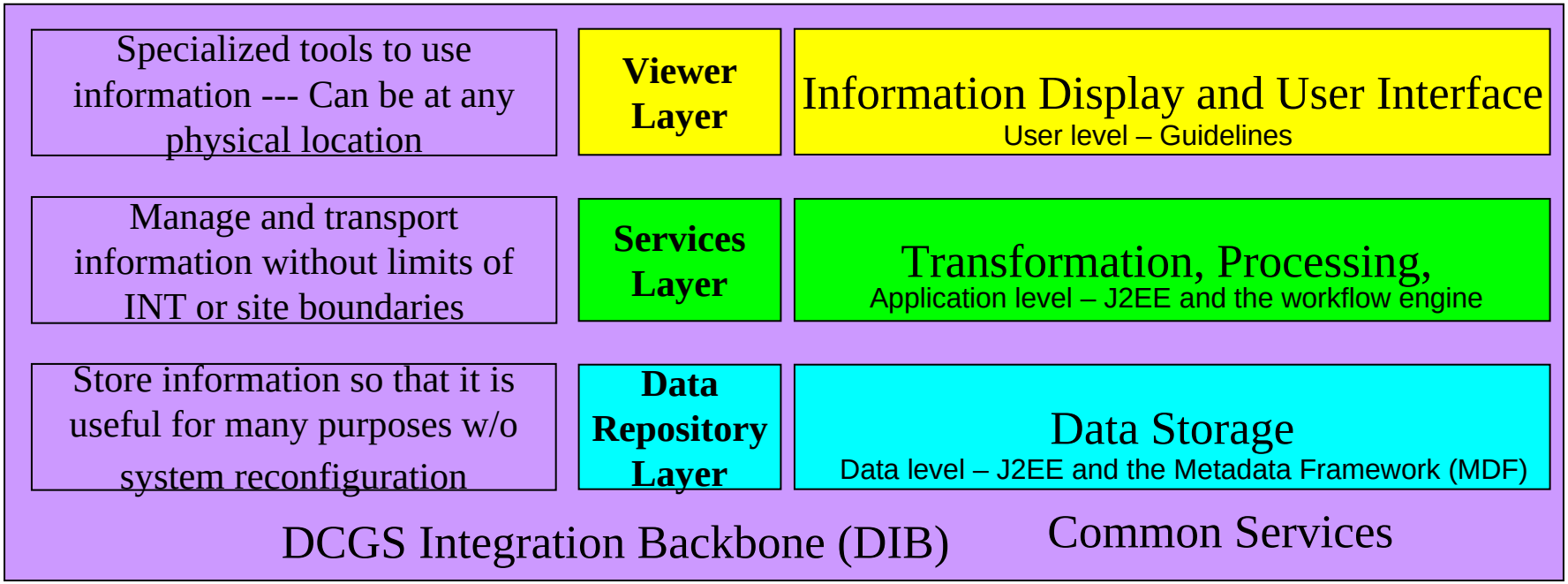
f. Ensure supporting communication plans and the ISR enterprise are compliant with the Global Information Grid (GIG) architecture.

DIB – Focal Point for Net Centric ISR

Data Interoperability



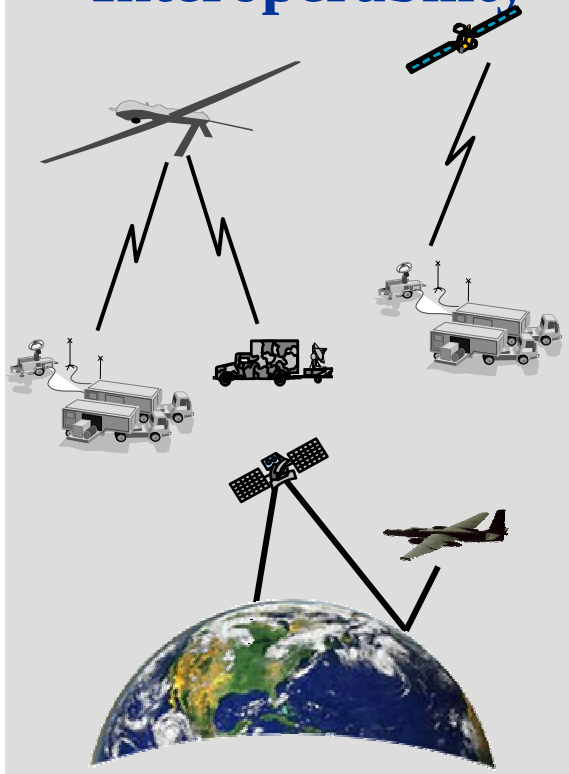
DIB Milestones



- **March 05 DIB Delivery to AF DGS-X**
- **April 05 DIB Available to other Service PMs**
- **June 05 DIB DD250**
  - FY05 17 Suites (Navy-8, USMC-2, Air Force-5, NGA-2)
  - FY06 25 Suites (Army-10, Navy-8, Air Force-7)
  - FY07 33 Suites (Army-6, Navy-19, Air Force-8)

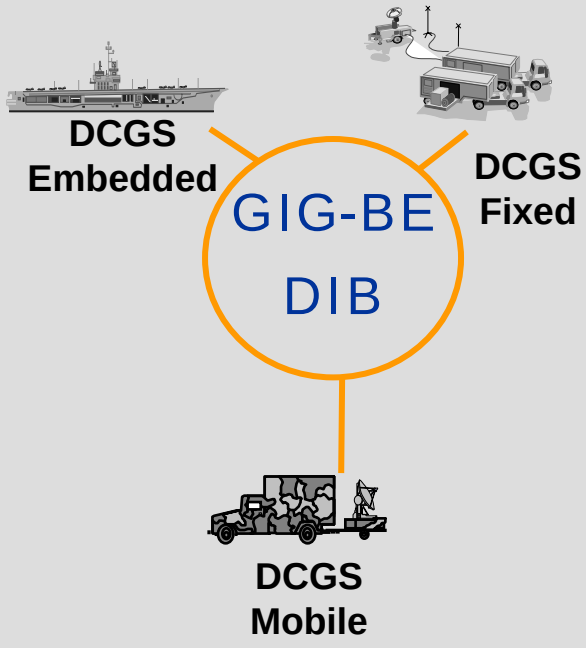
Distributed Common Ground/Surface Systems (DCGS)

DCGS Today "Interoperability



"AS IS" 2000-04

DoD-DCGS "Net-Centric"

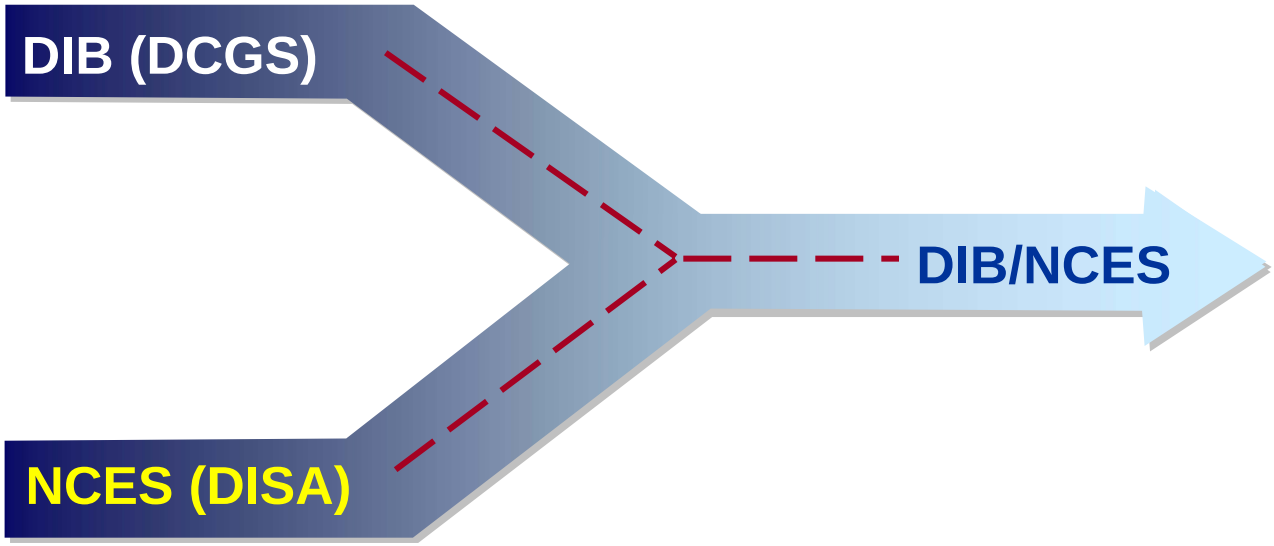


Transition 2004-06

ISR "Enterprise"

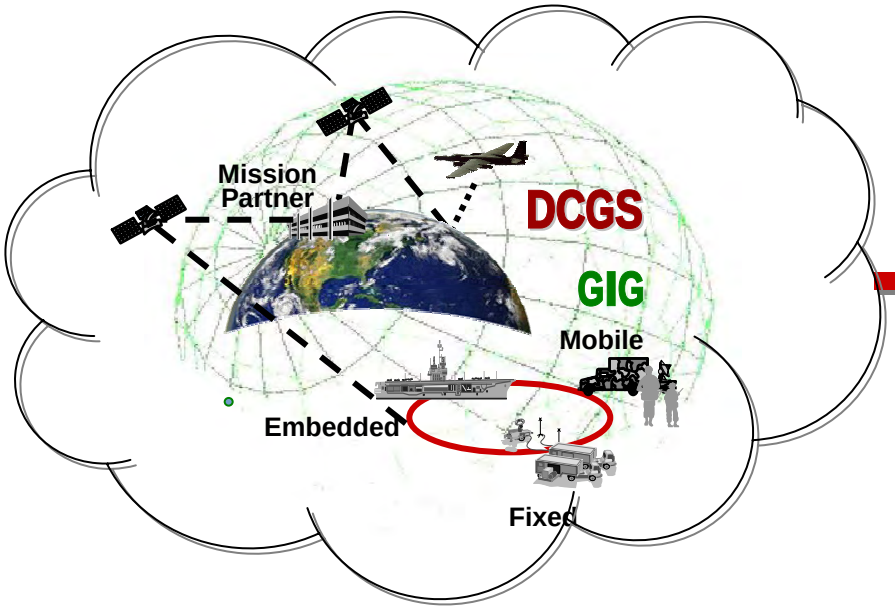
"TO BE" 2006-11

Migration to Common Enterprise Services



ISR Enterprise Service COI formed to merge multiple ISR programs collaboration services

DCGS Interoperability with National Agency Systems



- NGA: GEOSCOUT
- NSA: CMM
- NSA: TRAILBLAZER

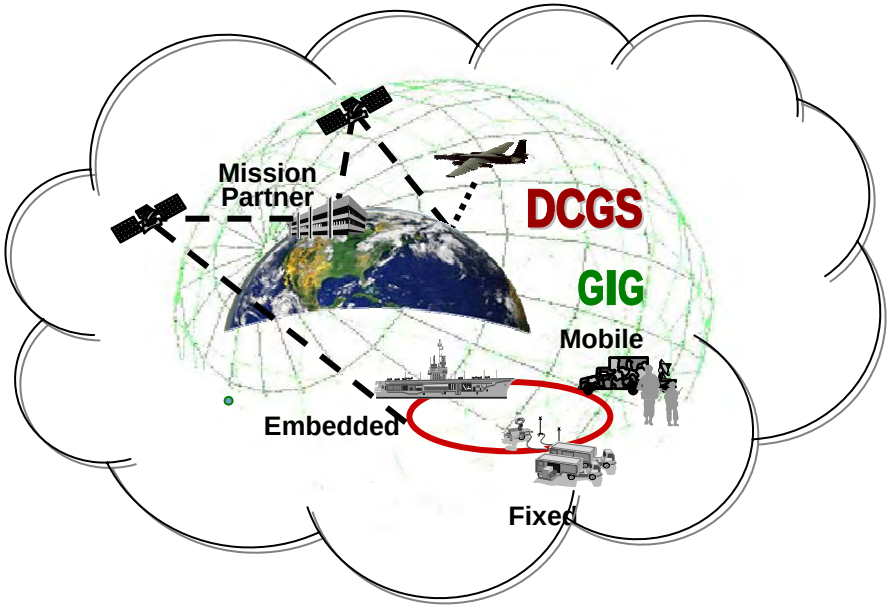
Requires close coordination with GeoScout, SOSCOE, CMM and Trail Blazer

Develop Data Exchange Formats / Standards

- **As we move toward Data Repositories there is a need for DoD or National Data Standards**

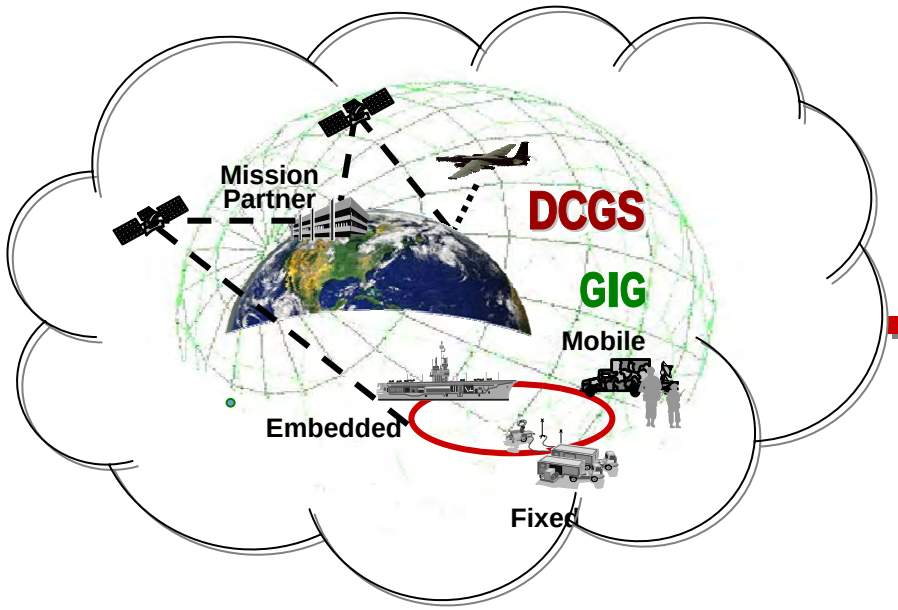
IMINT	SIGINT	MASINT
• NITF 2.1 • MPEG – 2 • NATO STANAG 4607	• NATO STANAG 4633 (ELINT) – **In Coord.** • NSTF?	• NMTF? Future Effort

DCGS and C2 Interoperability



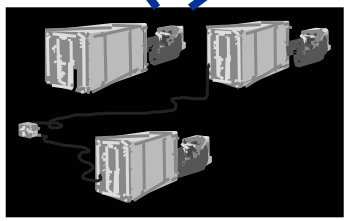
DCGS is a JBMC2 Pathfinder Program

DCGS Interoperability with Allies



Tornado RAPTOR

Canberra PR9 RADEOS



Other Allies to Follow

Empire Challenge is leading the way

Unified Cryptologic Architecture (UCA)

for
NDIA Net-Centric Operations Conference

22 March 2005

UCA Value Proposition

- Under DIRNSA's Community Functional Lead for Cryptology authority, the UCA needs to describe how we work together as an integrated team – establishing an overall DoD SIGINT Architecture.
- The UCA must establish collective practices and promote coordinated efforts.
- The UCAO needs to exercise cross-service oversight of joint intelligence, surveillance and reconnaissance SIGINT activities.

Derived from HPSCI Markup Language

UCAO

- Community office focused on exercising DIRNSA CFL for Cryptology responsibilities
- Comprised of 9 Partners:

NSA/CSS	Air Force	Marine Corps
NRO	Army	Navy
DIA	Coast Guard	
CIA		

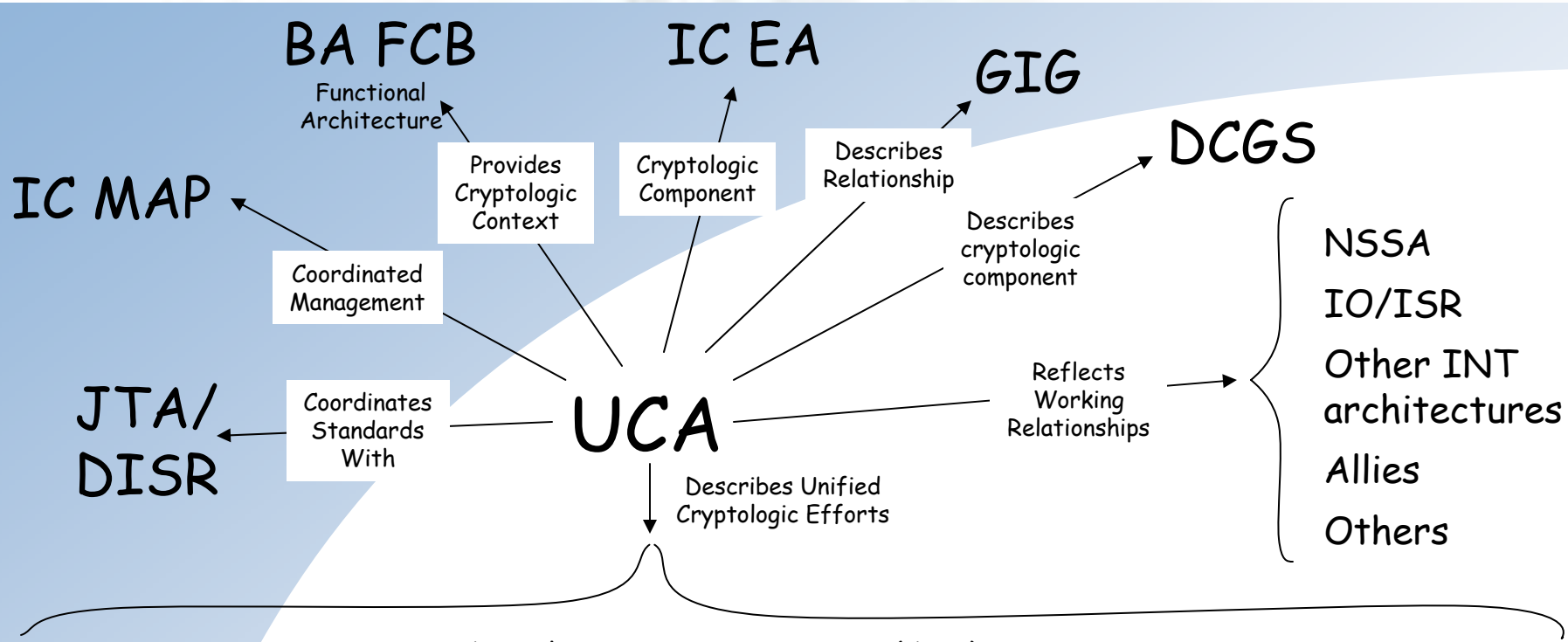
- Dual role/responsibilities as NSA/CSS Engineering Directorate

UCAO | DE
Unified Cryptologic Architecture Office
NSA/CSS Directorate of Engineering

Objectives

- Promote a **common architectural construct** for our collective cryptologic capabilities
- Establish a **common language and taxonomy** for describing and analyzing these capabilities
- Demonstrate our collaborative efforts to produce **unified cryptologic capabilities**
- Provide information environment that enables **informed** operational, management, technical and investment **decisions**
- **Promote unity** while respecting individual autonomy
- Represent a **unified cryptologic front** to external entities
- Establish uniform architecture review and approval procedures

UCA Relationships



UCAO | DE
Unified Cryptologic Architecture Office
NSA/CSS Directorate of Engineering

Promotes

- Unified Operations
- NSA/CSS Transformation
- Net Centric Operations
- Horizontal Integration
- Multi-Int Integration
- Distributed Cryptologic Operations
- System of Services
- Sharing Data as a Default Position

Through

- UCS CONOP
- Allocated Requirements
- Integrated Architecting Teams
  - UCA NSA/CSS ACA AFCA MCA
- Integrated Processes/Products
  - Data Modeling WIPT
  - Service Reference Model WIPT
  - UCA TV
  - GIG IA Architecture
- Coordination with:
  - IC
  - DoD
  - Allies

DCGS Specific

- UCA and related architecture efforts will describe the Cryptologic component of DCGS
- SIGINT Customer
- Cryptologic Partners
  - Service Cryptologic Architectures
    - Defining Operational Relationships
    - Developing Business Models
    - Capturing Data Flows
    - Common Data Models
    - Documenting Interfaces
    - Applying Standards

Questions

?

Larry Carroll
SID Technical Lead Horizontal Integration
ldcarro@nsa.gov
ldcarro@nsa.ic.gov
443-479-5868

Curtis Mitchell
UCAO/DE Architecture Portfolio Manager
cemitch@nsa.gov
cemitch@nsa.smil.mil
cemitch@nsa.ic.gov
301-688-3955/44

Success Criteria for HI

- Mission Management (CMM)
  - Mission CONOP
    - Common understanding of problem
    - More than INs
- J2EE/Web Service Standards
  - N Tier vs 2 Tier
  - Thin vs Thick Clients
  - M-M vs P-P
  - Open vs Stovepipe Architecture
  - Client/Server vs Services Based

Success Criteria for HI

- Common Data Standards
  - SIGINT Data Model
  - SIGINT Format
    - NSA Migration Plan
    - USSID/Reports
- IA Security
  - PL3 US Only
  - PL3+ Partners
  - Replication for SIPR

UCAO/DE Structure

USSG

- USN
- USMC
- USCG
- USA
- USAF
- CIA
- NRO
- DIA
- NSA

SEAB

- ESE
  all portfolio managers
- ITI
- CIO
- SIGINT
- IA
- CBS
- FAD
- JHU/APL

Director: Unified Cryptologic Architecture Office
and
Chief DE: Architecture and Systems Engineering (SE/A)

Forward Deployed

- SIGINT Chief SE/A
- IA Chief SE/A
- ITI Chief SE/A
- CBS Chief SE/A
- PEO Program Chief Engineers

- Link to Mission requirements generation
- Link to Missions
- Link to PEO Program SE
- Link to non-PEO program integration

5 Portfolios

Community Partner Representatives

- USN
- USMC
- USCG
- USA
- USAF
- CIA
- NRO
- DIA
- NSA

- Link to Partner Missions
- Link to Community Programs (e.g, DCGS)

Integration

- LSI Contract O/S
- Integration
- System Interface Management
- Standards Program
- IMS

- Link to PEO
- Link to major Programs

SE/A Analyses and Issues

- Program SE/A Analyses
- Special Focus Issues
- Implementation Analyses
- SE/A Investigations
- Simulation and Modeling
- Architecture Performance assessment

- Link to Mission threads
- Link to SAE
- Link to CEMO

Architecture

- Architecture Guidance
- Enterprise Architecture Development
- Interface Management
- Arch Contract O/S
- V&V

- Link to CIO
- Link to IT IS
- Link to NTIO
- Link to External Architectures
- Link to Community Programs (e.g., ICSIS)

Process

- SE Process/Policy
- SWE Process/Policy
- CM Process/Policy
- QA Process/Policy
- Process Improvement
- Test/Deployment Process/Policy
- Certification Programs
- PI Contract O/S

- Link to Prof Health
- Link to ADET
- Link to OTA

Planning & Financial Management

- CPPG
- Tech Forecast
- ECMRG Support
- USSG Support
- SE/A Strategic Planning
- EC Management
- Program Builds
- Legislative Affairs

- Link to Corporate Planning Processes
- Link to Finance
- Link to LAO

UCAO | DE
Unified Cryptologic Architecture Office
NSA/CSS Directorate of Engineering

NSA/CSS EA

- Enterprise wide in perspective
- Two levels
  - Above Program
  - Program
- Comprised of Four Business Segments
  - SIGINT
  - Information Assurance
  - Information Technology
  - Corporate Business
- Comprises “as is” through “to be”

Governance

- Integrated into NSA/CSS Policy
  - Strategic Management Process
  - System Engineering
- System Engineering and Architecture Board (SEAB)
- Enterprise Architecture Working Group (EAWG)
- Business Unit Architecture Working Groups
- Program Level Architectures
- Architecture Development and Management Plan (ADMP)

Enterprise Information Environment Mission Area (EIEMA)

NDIA Net-Centric Operations, Interoperability, and Systems Integration Conference Panel

Phil Minor
EIEMA Director
Office of the DoD CIO
philip.minor@osd.mil

22 March 2005

Why EIEMA?

- One of four top-level IT portfolios outlined by the Deputy Secretary of Defense in his March 2004 policy guidance for IT management by portfolio.
  - EIEMA lead assigned to ASD (NII)/DoD CIO as the DoD CIO.
- 20-years of gradual movement toward managing IT by portfolio:
  - Evolution of role of CIOs in private sector,
  - Capital Investment and Planning and Corporate Information Management initiatives,
  - Clinger Cohen Act and OMB federal oversight of IT,
  - Formalization of CIO functions in DoD, establishment of BMMP.
- Current and pending policy guidance:
  - DoD CIO Memo of 14 July 2004 established EIEMA Domains and Owners
  - DODD 8115 (IT Portfolio Management) and associated Instruction – in draft/coordination stage

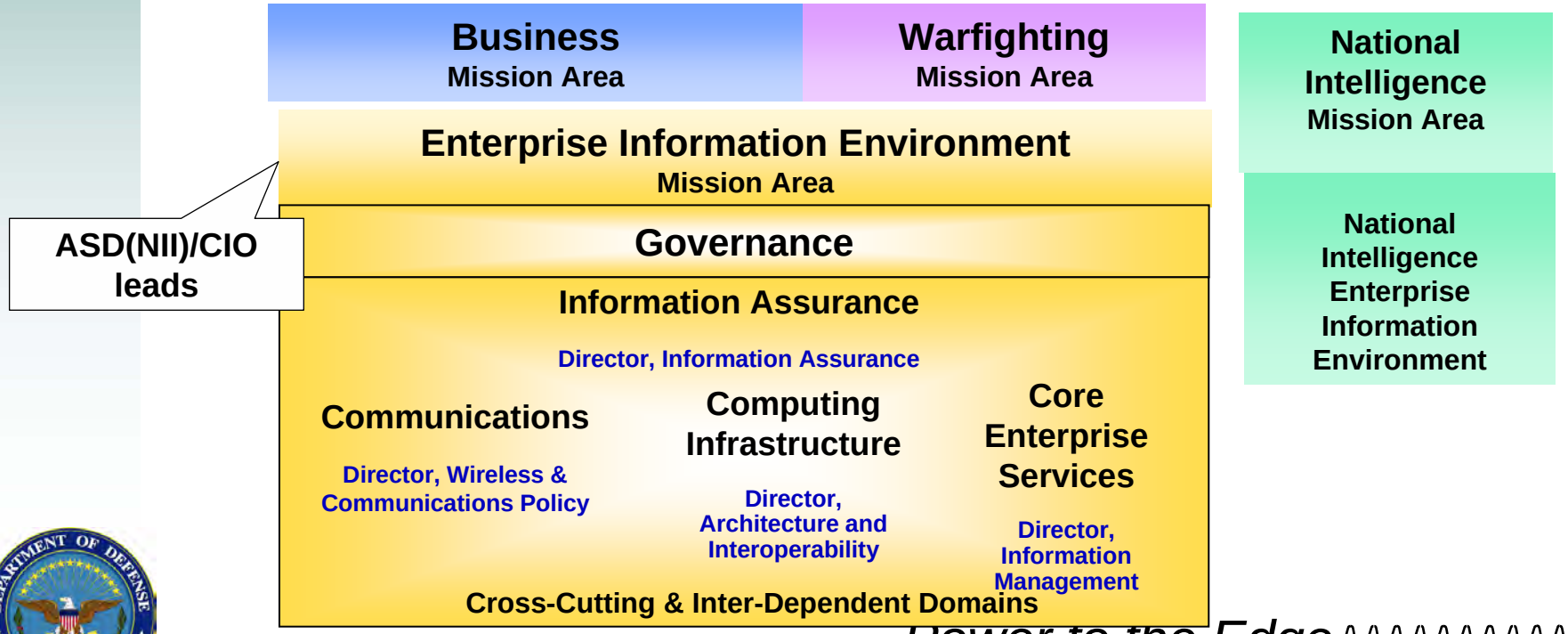
Objectives of Pending PfM Policy

- **IT investments** shall be managed as portfolios to maximize return to the Enterprise.
- Portfolios exist at **multiple levels**. The Enterprise is divided into Mission Area portfolios, which are defined as Warfighting, Business, DoD Portion of NIP, and EIE.
- A **Cross-Mission Area governance forum** to be established to oversee management of the Enterprise portfolio
- Each portfolio to be managed **using the GIG Integrated Architecture**, integrated plans, risk management techniques, capability goals and objectives, and performance measures.
- Portfolio management processes shall be **incorporated and integrated with each of the Department's principal decision support systems**: Capability Needs (JCIDS), Acquisition, PPBE.

EIEMA Scope

- The EIEMA portfolio comprises the foundational IT capabilities that support and enable the other DoD IT Mission Areas and network-centric operations
- Four inter-dependent Domains (sub-portfolios):
  - Communications
  - Computing Infrastructure
  - Core Enterprise Services
  - Information Assurance

Challenge: Define the Domain-level trade spaces, but keep boundaries "porous"



EIEMA Value Proposition

- Champion and serve as a focused advocate – with a portfolio-wide perspective – for the synchronization, convergence, and net-centricity of the Department's EIE capabilities.
- At the DoD level, champion a process transition from a program-by-program focus to an end-to-end portfolio focus.
  - Exploit portfolio-wide focus to reduce IT implementation cycle
- Leverage the nexus of the two policy thrusts:
  - Transformation (to a net-centric environment and network-centric operations and warfare)
  - IT management by portfolio

EIEMA is in its infancy as an IT Portfolio.

The process changes and benefits of IT PfM will require time to manifest.

EIEMA Panel Introduction

- Danny Price, Communications Domain: Net-Centric Operating Environment (NCOE) – a first attempt to practice IT portfolio management for a cross-Domain sub-portfolio of EIEMA
- Maria Samuda, Computing Infrastructure Domain: CID goals and status -- challenges of starting an IT portfolio from scratch.
- Terry Hagle, Architecture and Interoperability Directorate, DCIO: How does an IT portfolio use the GIG Integrated Architecture in its PfM process?
- Tim Bass, SilkRoad: The Yin and Yang of IT PfM: net-centricity vs capital planning and investment control.

Disclaimer: Panelists are giving individual insights and views -- our purpose is not to articulate official DoD positions.

U. S. Air Force Lead

Integrity - Service - Excellence

Joint Pilot Time-Sensitive Target Community Of Interest (TST COI) Threads

Net Centric Operations, Interoperability & Systems Integration Conference
24 Mar 05

Mr. Jon Park
Air Force C2 & ISR Center/DO

U.S. AIR FORCE

Joint Pilot TST COI Threads

- Background
- TST and COI defined
- Overview
- Deliverables
- Schedule
- Governance
- Expectations / Resources
- Recommendation

U.S. AIR FORCE

DOD Data Strategy Background

Source / Implementation Authorities

- DOD Net-Centric Data Strategy, May 2003
- Management Initiative Decision (MID) 912, Jan 2003
- JBMC2 Roadmap - Chapter 6, JBMC2 Data Strategy, Apr 20
- JBMC2 Board of Directors Endorsement, Oct 2004 (SECDEF)
- Joint Requirements Oversight Council Memorandum 199-04, Oct 2004
  - USJFCOM Deputy Commander's Memorandum, Nov 2004
- Partnership with JFCOM on TST COI

U.S. AIR FORCE

How data policy affects TSTs

It's ALL about the data throughout the WHOLE kill chain

- **FIND, FIX, TRACK, TARGET, ENGAGE, ASSESS**
- **Up-front planning for, readiness for TST appearances**
- **Much of the current targeting data it is not visible, accessible or understandable; discovery difficult**
- **Process for TST engagement has made progress using ADOCS / WEEMC mission managers, Chat; enables collaboration but still takes too long,**
- **Targeting data not easily sorted, filtered for short response TST engagement cycle**
- **Tagging a solution but xml already has 94,000 tags**
- **Data has to be arranged to help not hinder response**

U.S. AIR FORCE

Definitions

Time-Sensitive Target –

- **"Those targets requiring immediate response because they pose (or will soon pose) a danger to friendly forces or are highly lucrative, fleeting targets of opportunity. Also called TSTs."**

- JP 1-02

Community of Interest –

- **"COI is a term used to describe any collaborative group of users who must exchange information in pursuit of their shared goals, interests, missions, or business processes, and who therefore must have shared vocabulary for the information they exchange."**

- DOD Net-Centric Data Strategy

U.S. AIR FORCE

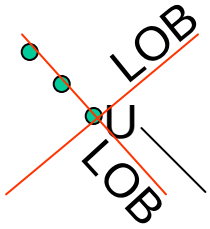
Thrust-Piggyback on Joint Efforts

- ALSA TST MTTP
- Joint Fires Initiative
- Joint Mission Threads
- Experimentation from JFCOM, Services
- Others

U.S. AIR FORCE

Joint TST Thread

Plan | **Find** | Fix | Track | Target | Engage | Assess



Emitters?
Special Case
NCCT may generate track before radars, ladars acquire

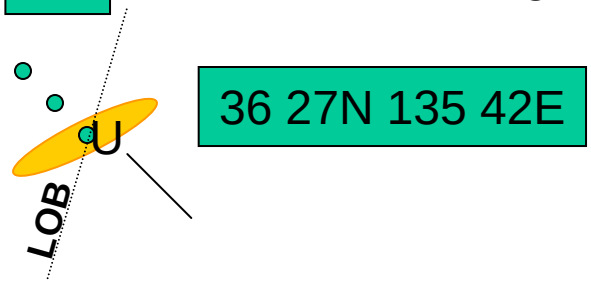
- Sensor detects track, waits until three hits occur, starts tracking
- Distinguish between mobile tracks and stationary targets

Service systems must promote an operational synergy by sharing target data, confirming or validating the target, and then engaging the target using the best weapon for effect within the appropriate response time as required by the JFC

U.S. AIR FORCE

Fixing

Find | **Fix** | Track | Target | Engage | Assess

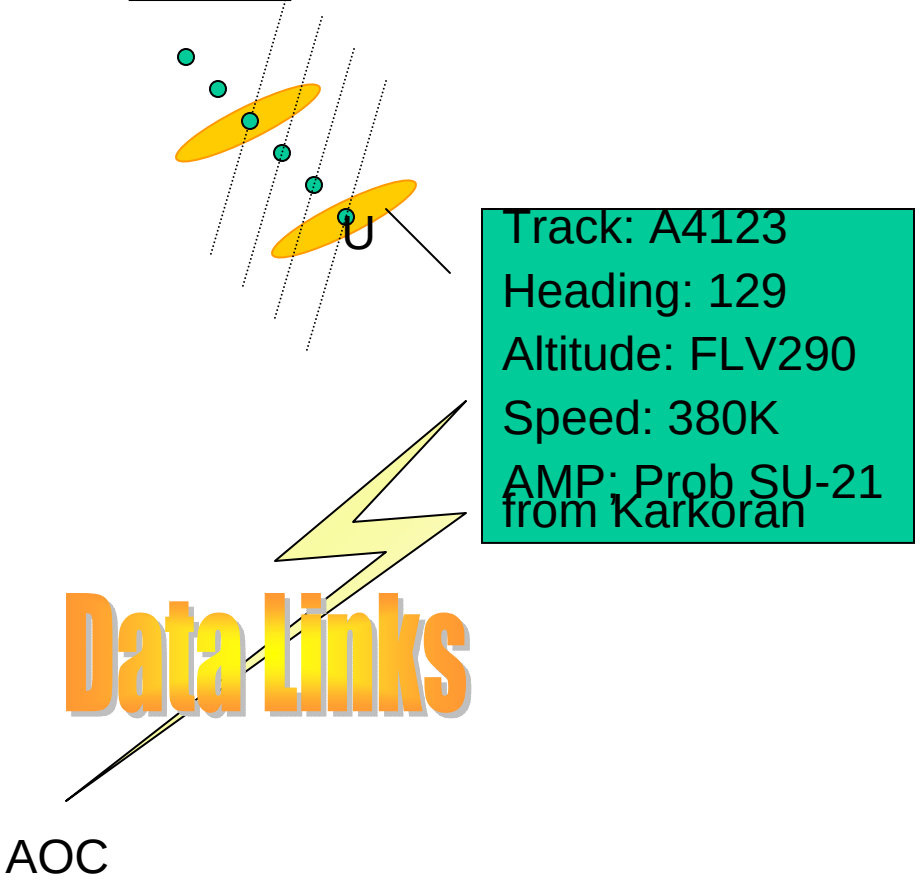


- Several other sensors are cued to look at the track to determine what the target is
- If the target matches TST criteria, track is handled differently

U.S. AIR FORCE

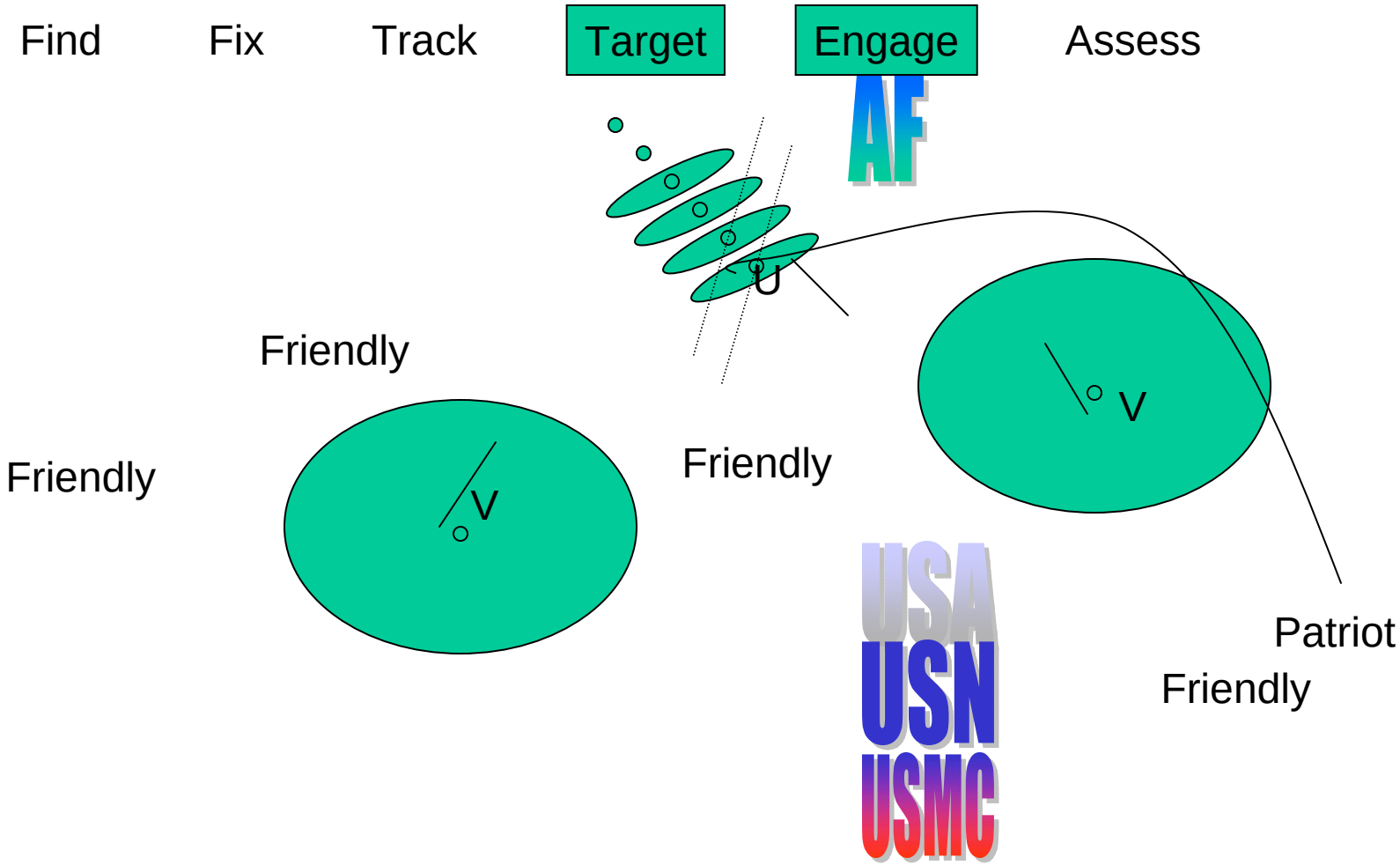
Tracking

Find Fix **Track** Target Engage Assess



U.S. AIR FORCE

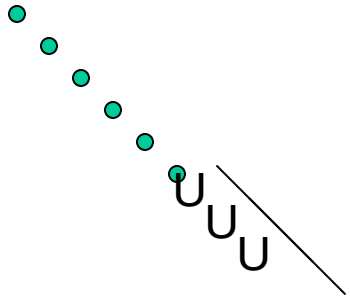
Targeting, Engagement



U.S. AIR FORCE

Assessment

Find Fix Track Target Engage **Assess**



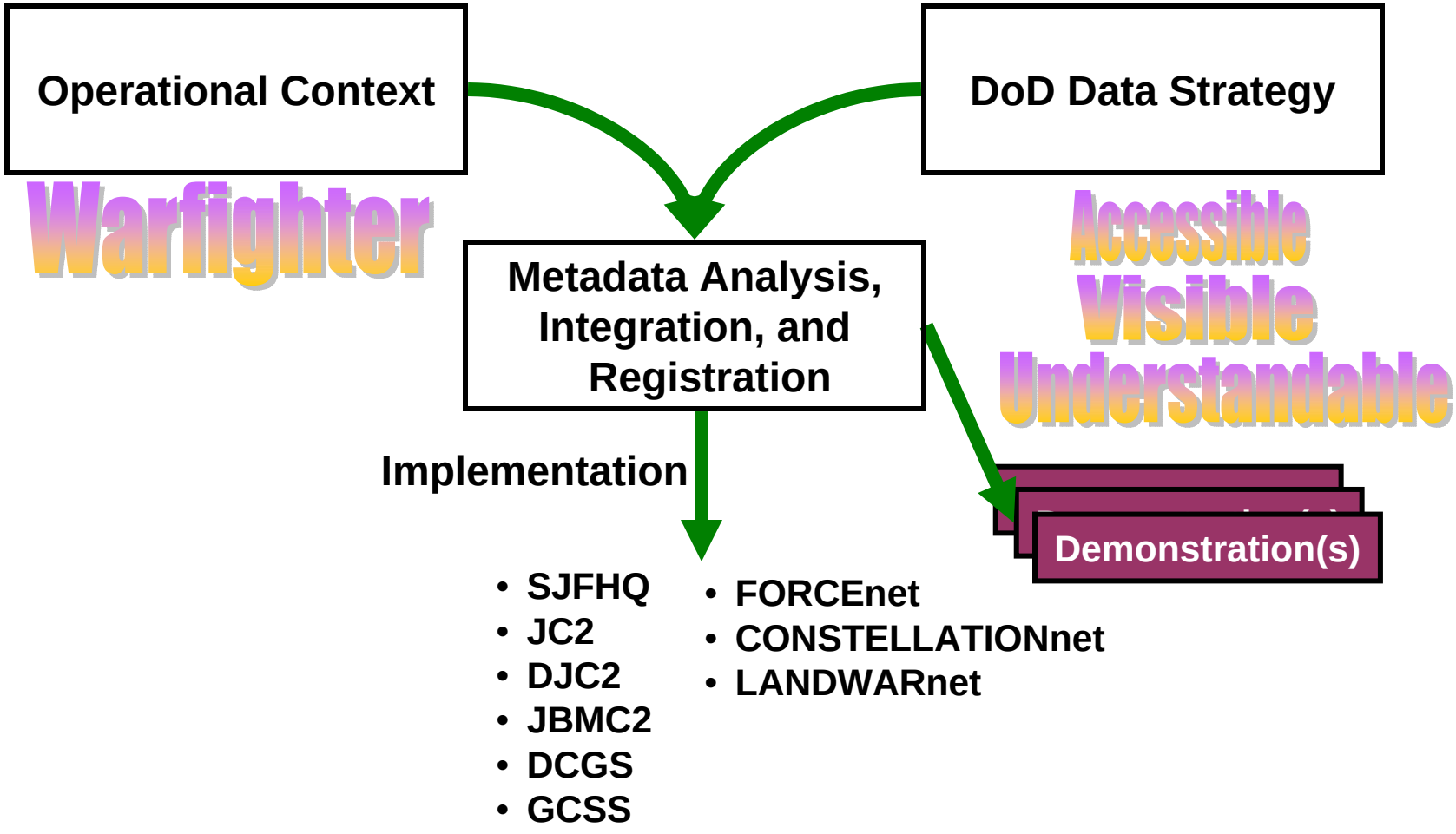
U.S. AIR FORCE

Specifying Data

Find	Fix	Track	Target	Engage	Assess
Data	Data	Data	Data	Data	Data
Sensor data	Coordinates	BE #s	ATO	USAF Weapons	Post strike sensor
Collectors	Altitidues	Track #s	ACO	USA Weapons	IPB/PBA
IPB/PBA	GPS	Datalinks	BFT	USN Weapons	Radar
Radar	Georefs	Amp Info	FSCL	USMC Weapons	EW
EW	Applications	Intent	CAS	Allies	SOF
SOF		Originator		Coalition	UGS
UGS				Intel appls/plans	Video
Video					Ladar
Ladar					

U.S. AIR FORCE

Joint Pilot TST COI Overview



U.S. AIR FORCE

Joint Pilot TST COI Deliverables

Deliverable	Purpose
COI scope statement	Defines the mission, scope, and responsibilities of COI
Charter / MOU to integrate / pilot COI capabilities *(as required)*	Ensures agreements are in place to make use of COI products (data standards, web services)
COI vocabulary *(e.g. taxonomy and definition of terms)*	Helps to organize and classify COI data and services
Discovery Catalog	Capability that allows GIG-users to find and retrieve COI data / information
Data models and schema	Defines specifications / models for the sharing of information (supports web services)
Data & Information Web Services	Discoverable, re-usable services that provide COI-related information
Pilot COI service within scheduled net-centric event *(e.g. JEFX, NCCP, etc.)*	Demonstrations of COI services within real-world applications / context

U.S. AIR FORCE

Joint Pilot TST COI Schedule

05				06			
Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec

COI Statement /Charter / MOU

CONOPS/TTP/etc Review

Warfighter Analysis Workshops

1 2 3 4

Taxonomy / Schema Development

1 2 3 4

LOE-1 **LOE-2** **LOE-3**

Mini BOD BOD Brief

FCB Briefs

JEFX '06

= Warfighter Analysis Workshops
1. Target
2. Engage
3. Assess
4. Find / Fix / Track

= XML Schema delivery(s)

= JEFX Spirals

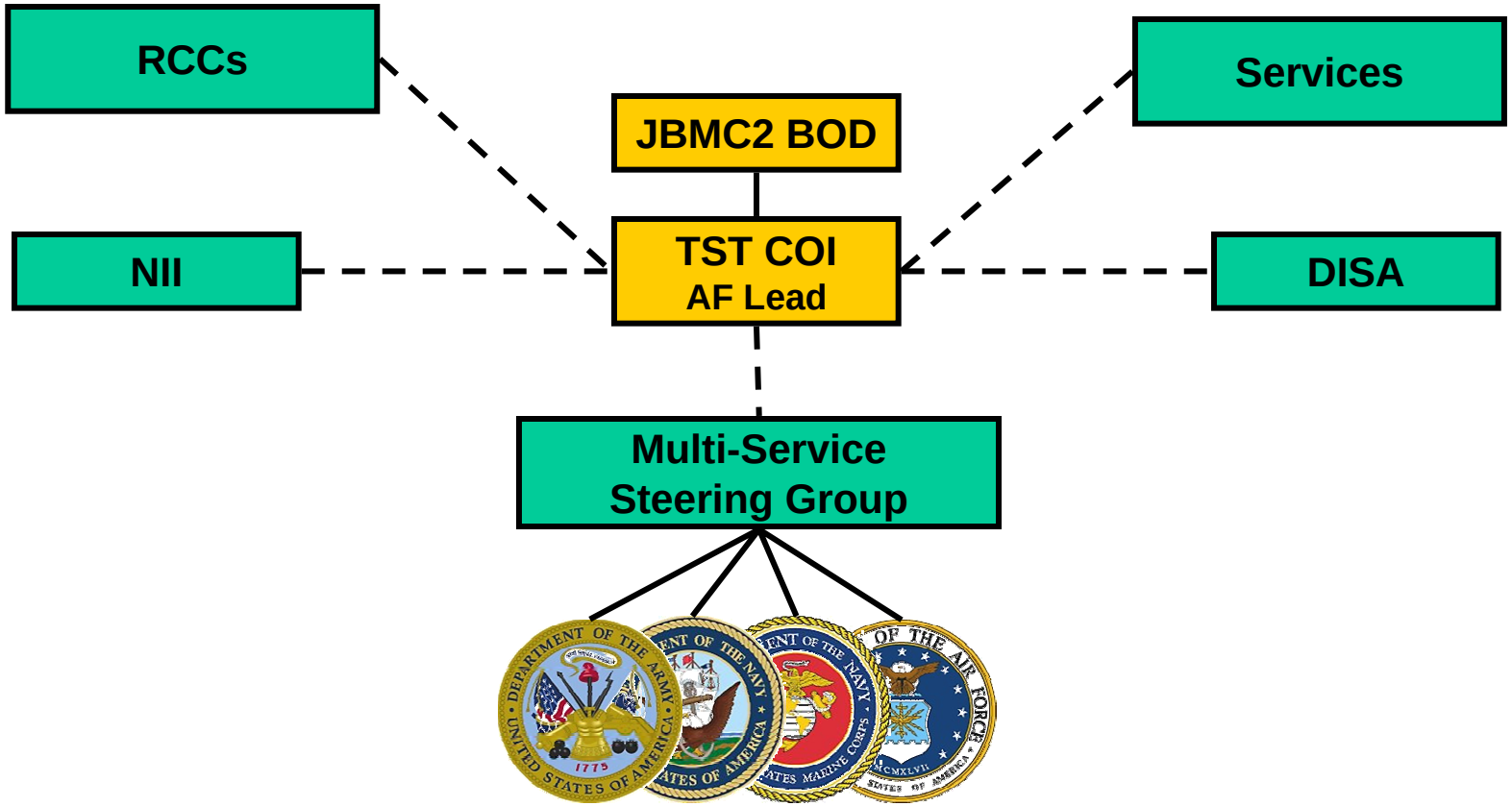
TST COI Registry

Data, Information, and Discovery Services Development

05				06			
Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec

U.S. AIR FORCE

Joint Pilot TST COI Governance



U.S. AIR FORCE

Joint Pilot TST COI Expectations / Resources

- **AF will provide the following:**
  - **Establish and lead the Joint TST COI**
  - **Champion the COI's activities and actively work with acq community to utilize COI-developed capabilities within their respective Programs**
  - **Oversee approaches to ensure 1) alignment with net-centric objectives and 2) use of enterprise capabilities (where applicable)**
  - **Provide resources to manage the COI's activities and to facilitate meetings and working sessions**
- **JFCOM will provide the following:**
  - **Staff resources to provide integration, operational, technical advice / guidance.**
  - **Engagement with C/S/A and have them identify appropriate Subject Matter Experts**
  - **Ongoing LOE opportunities with JSIC and J9**
  - **One on-site FTE to AFC2ISRC, in addition to 0-5 Lead, GS Deputy, one Data Modeler and one Web Service Engineer at JFCOM to assist in multi-service coordination and analysis, integration, development, and registration**

U.S. AIR FORCE

Joint Pilot TST COI Expectations / Resources

- **COCOMS / Services / Agencies will:**
  - **Provide authoritative Operators and Technical SMEs with access to representative C/S/A data and information systems to participate in working groups**
  - **Identify existing / planned Joint Time-Sensitive Targeting information sharing activities**
  - **Work with Program Managers to incorporate COI-developed capabilities within their programs (experiments, exercises, LOEs)**
  - **Synchronize and leverage technical approaches to ensure alignment with net-centric objectives**

- **Program (POM$) sustainment for this effort to assure success for Joint TST and Targeting data standards**

U.S. AIR FORCE

Working with Pilot BFT COI

- **The Joint Pilot TST and Pilot BFT COIs are two sides of the same coin**
  - **The Joint Pilot TST COI will support rapid and efficient targeting by focusing on data needed to make engagements**
  - **The Joint Pilot BFT COI will provide information for preventing fratricide and enhancing our situational awareness with:**
    - **Combat ID**
    - **BF Situational Awareness [Dispersion]**
    - **Force Location, [and or position]**
    - **Force Intent**
    - **Force Mission**
    - **Force Elements**
    - **Force Capabilities**
- **All needed for rapid targeting and Engagement**

U.S. AIR FORCE

Laying out the battlespace

Placeholder

U.S. AIR FORCE

Questions

U.S. AIR FORCE

Recent ESC TST Architecture Efforts

- ESC has collaborated with AFC2ISRC to develop TST architecture product System and Technical Views
  - Applied architectures to CRRA analyses
- Worked cross service TST Architectures with Navy SPAWAR and Army TRADOC
  - Leveraged diverse contractor team to pave the way to implementation
  - Identified interoperability touchpoints
- Demonstrated application of architecture TVs to actual systems
- Ready to move forward

U.S. AIR FORCE

Joint Pilot TST COI History

Source / Implementation Authority

Partners
OSD/DCIO/(NII), USJFCOM, USAF

Prepping the Battlespace
- 17/18 Aug 04: Net-Centric Focused Forum 2 Pilots (TST/ BFT)
- 26 Aug 04: USJFCOM / OSD(NII) COI IPR
- 31 Aug 04: USJFCOM Component Commander's Meeting
- 19 Oct 04: TST COI meeting at Pentagon - AF investigates lead
- 20 Oct 04: JBMC2 BoD TST COI & BFT COI developing initiative
- 28 Oct 04: DOD NII/Deputy CIO forum – JFCOM Game plan for COIs
- 8 Nov 04: AF TST COI meeting at XII Rosslyn
- 2 Dec 04: USJFCOM Component Commander's Meeting
- 20 Jan 05: Mini BOD Meeting**
- 17 Feb 05: JBMC2 BOD Meeting

Moving Forward
- Establish Joint Working groups
- Collaborate with other COIs

Net-Centric Operational Environment (NCOE)

Project Framework

Danny Price
OSD (NII)/ Wireless
March 22, 2005

Background

- Realization of a net-centric operations environment will significantly enhance DoD warfighting and business capabilities through greatly increased sharing of information and coordination of activities.

- This realization requires the synchronization and integration of multiple programs. The number and complexity of the programs involved and shortcomings in current DoD processes make this realization a significant challenge for the Department.

- NCOE initiative addresses the “key enablers” of the GIG core infrastructure.

- NCOE is a cross-cutting initiative with the end objective being an overarching DoD plan that addresses cross-program: capabilities definition, program implementation, operations, and governance for the NCOE programs.

Deliverables

- **<u>Task 1</u>: NCOE Joint Integrating Concept (JIC) and illustrative CONOPS which will serve as the basis for a Capabilities Based Assessment (CBA)**
  - NCOE Enabling Concepts
  - JCIDS Documentation for NCOE Capabilities

- **<u>Task 2</u>: NCOE Implementation Roadmap and TOR**
  - NCOE Overarching Strategy
  - Implementation Roadmap
  - Analysis Of Organizational Roles And Responsibilities Identifying Overlaps And Gaps
  - Recommended Specific Modifications To Existing Unified Command Plan (UCP), MIDs, Organization Charters And Other Appropriate DoD Policies

- **<u>Task 3</u>: Governance/Management COAs and Alternative Solutions**
  - Comparison Of Options With Recommendations
  - Implementation Plan
  - Recommended Language For Changes In DoD Policy And Required Changes In Legislation if needed

Task 2-Objectives

- Task 2a: Develop a roadmap/implementation plan that ensures:
  - The NCOE program set (key enablers of the GIG core infrastructure [GIG-BE, JTRS, TSAT, NCES, GIG-IA, Teleport, {JNMS}]) are executed in a synchronized fashion so that the GIG evolves coherently and meets user needs
  - Also addresses other SATCOM programs (WGS, AEHF, MUOS), as well as cross-cutting areas such as spectrum, data strategy, system engineering, satellite terminals, and integrated network management

- Task 2b: Evaluate and clarify current Departmental roles and responsibilities in regard to advocacy, technical and acquisition oversight; define the appropriate governance structure for the NCOE portfolio

Roadmap/Implementation Plan Framework

- Vision
- Technical and Operational Design Tenets
- Assessment of Capability Deliveries
  - Issue/Risk Identification
  - Assessment and Prioritization
- Integrated Transition Plan
  - Synchronized Master Schedule
  - Investment Strategy
- Governance

DEPUTY SECRETARY OF DEFENSE

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
UNDER SECRETARIES OF DEFENSE
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
ASSISTANTS TO THE SECRETARY OF DEFENSE

SUBJECT: Net-Centric Operational Environment (NCOE) Roadmap and Implementation Plan

Net-centricity is the realization of a networked environment, including infrastructure, systems, processes, and people, that enables a completely different approach to warfighting and business operations. The foundation for net-centricity is the Department's Global Information Grid (GIG).

The GIG is the globally interconnected, end-to-end set of information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating, and managing information on demand to warfighters, defense policymakers, and support personnel. Net-centricity, by securely interconnecting people and systems independent of time or location, supports a substantially improved military situational awareness, better access to business information, and dramatically shortened decision cycles. Users are empowered to better protect assets, more effectively exploit information, more efficiently use resources, and create extended, collaborative communities to focus on the mission.

Key to net-centricity are the enabling components of the GIG core infrastructure which are evolving and identified as the NCOE program set. The purpose of this roadmap and implementation plan is to ensure the NCOE program set (GIG-BE, ITRS, TIAT, NCES, GIG-IA, Teleport, JWMD) are executed in a synchronized fashion so that the GIG evolves coherently and meets user needs.

Paul Wolfowitz

Vision

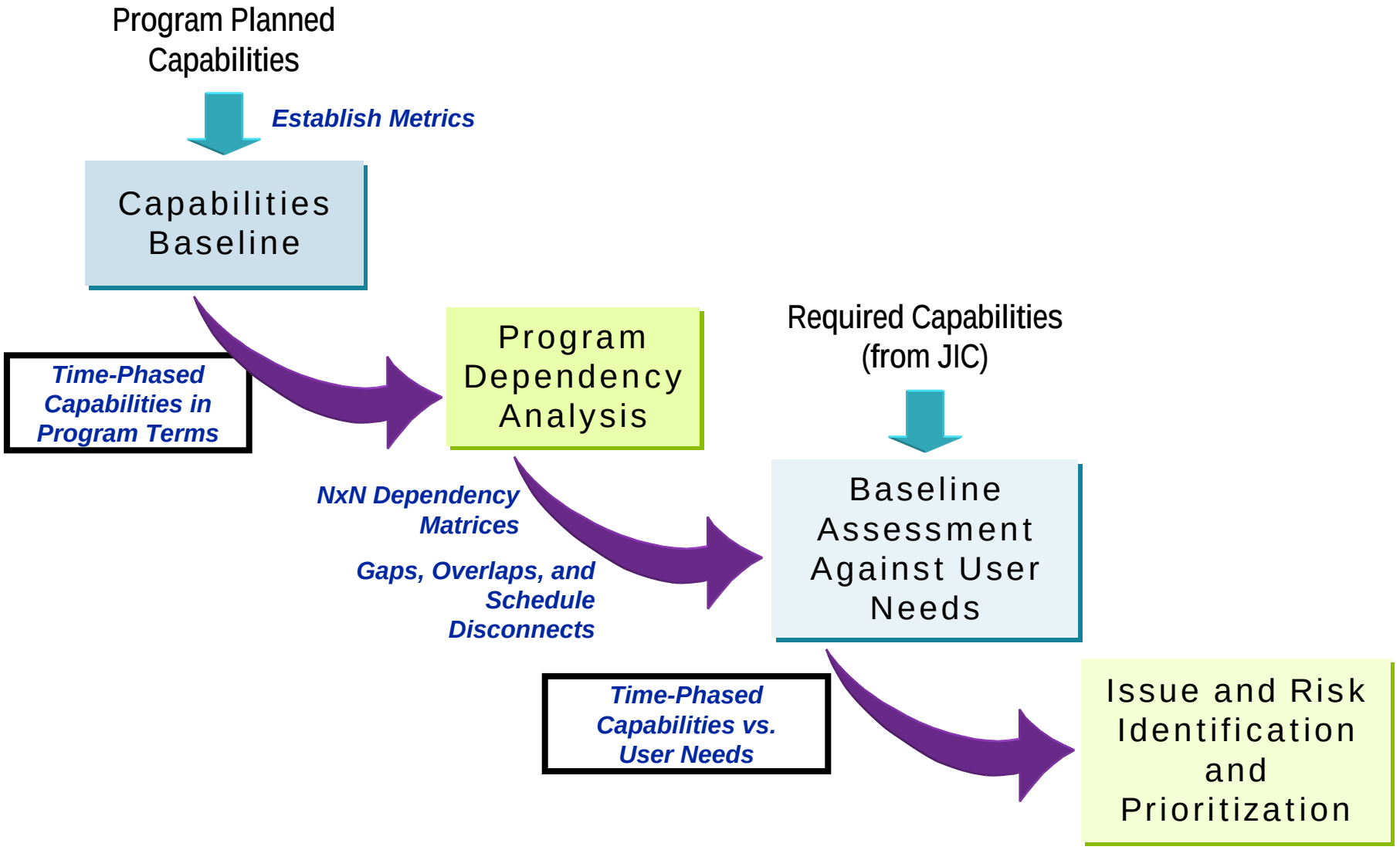
- ***GIG Vision:*** *Deliver "Power to the Edge" to enable and empower people at the edge of the network ("the edge" is considered wherever activity is occurring).*
  - We are building:
    - An agile, robust, interoperable and collaborative DoD
    - where warfighters, business and intelligence users all share knowledge
    - on a secure, dependable and global network
    - that enables excellent decision-making, effective operations and network-centric transformation

- ***NCOE Project Objective:*** *Enable and synchronize delivery of the key elements of the GIG core infrastructure in the context of future warfighting concepts.*
  - Support development of an enterprise information environment (EIE) that provides:
    - Robust global information transport
    - Integrated network management
    - Core enterprise services
    - Assured information

Design Tenets

- Use of Internet Protocol (IP)
- Provide secure and available communications
- Only handle information once (OHIO)
- Post data in parallel with processing it
- Support smart pull of information (rather than smart push)
- Make “the system” data-centric
- Support application diversity
- Users can pull multiple applications to access data, or collaborate using the same application
- Applications are posted to the net, and metadata-tagged for user discovery
- Support assured information sharing through trusted accessibility
- Provide quality of service via data timeliness, accuracy, completeness, integrity, and ease of use

Capabilities Assessment Process



Metrics

NCOE Capability Categories	Initial Capability Assessment Metrics
Robust Global Information Transport	• Connectivity, interoperability • Reliability and availability • Capacity
Integrated Network Management	• Network infrastructure monitoring and control • Network infrastructure performance reporting • Network infrastructure configuration management and planning • Integration of network and enterprise system management
Core Enterprise Services	• Visible, accessible, and understandable data • Collaboration support • Scalable services (related to functionality and capacity) • Number of users (related to capacity) • Availability at end user • Latency or Responsiveness at end user (usually a time measure) • Restoration of Service to end user (time measure)
Assured Information	• Assured information sharing • Highly available enterprise • Cyber situational awareness and network defense • Assured enterprise management and control

Capabilities Baseline

Teleport

Communications - Teleport					
Program		**2008**	**2012**	**2015**	**2020**
Teleport	**Number of Sites**	6 core sites+1 secondary site	6 core sites+1 enhanced secondary site	6 core sites+1 enhanced secondary site	6 upgraded core sites+1 enhanced secondary site
	SATCOM spectrum	Gen I&II, UHF, EHF (LDR & MDR), C band, X band, Ku band, Ka integration	Gen III, EHF (XDR) Upgrade, MUOS, Advanced Systems, Full IP/NETCENTRIC Implementation	Full operation capability (FOC) Gen III, EHF (XDR) Upgrade, MUOS, Advanced Systems, Full IP/NETCENTRIC Implementation, all terminals upgrades, Initial T-SAT	Full operation capability (FOC) of upgrades, FOC T-SAT
	Teleport Capacity (Mbps)	520	700	950	1300
	Terrestrial Capacity (Mbps)	1 Gbps	2 Gbps	3 Gbps	4 Gbps
	Terrestrial Networks	DISN Fixed DISN Deployed	DISN, JTRS, WIN-T, Special Nets, Services nets	DISN, JTRS, WIN-T, FCS, TDC, ADNS	DISN, JTRS, WIN-T, FCS, TDC, ADNS
	Networking and Protocols	IP, Circuit Switched	IP only	Terrestrial and Space based IP	Advanced IP
	IA	Link encryption, TACLANE, HAIPE	New versions HAIPE, Partial Black Core Network	Black Core Network	Black Core Network

N x N Dependencies Approach

Program	GIG-BE	Teleport	JTRS	TSAT	JNM	IA	NCES
GIG-BE						D	
Teleport							
JTRS						D	
TSAT						D	
JNM							
IA							
NCES						D	

Not complete

- **"D" indicates that the program listed in the row is dependent on the program listed in the column**
  - **e.g., IA is an enabler of GIG-BE, JTRS, TSAT, and NCES**

Integrated Transition Plan Development

Prioritized Risks/Issues from Capability Assessment

Develop and Assess Candidate Adjustments

Explore various alternatives to mitigating issues / risks

Based on Multiple Criteria: Cost, Schedule, Technical, Effectiveness, Risk

Select "Best" Adjustments

Use of decision analytic tools

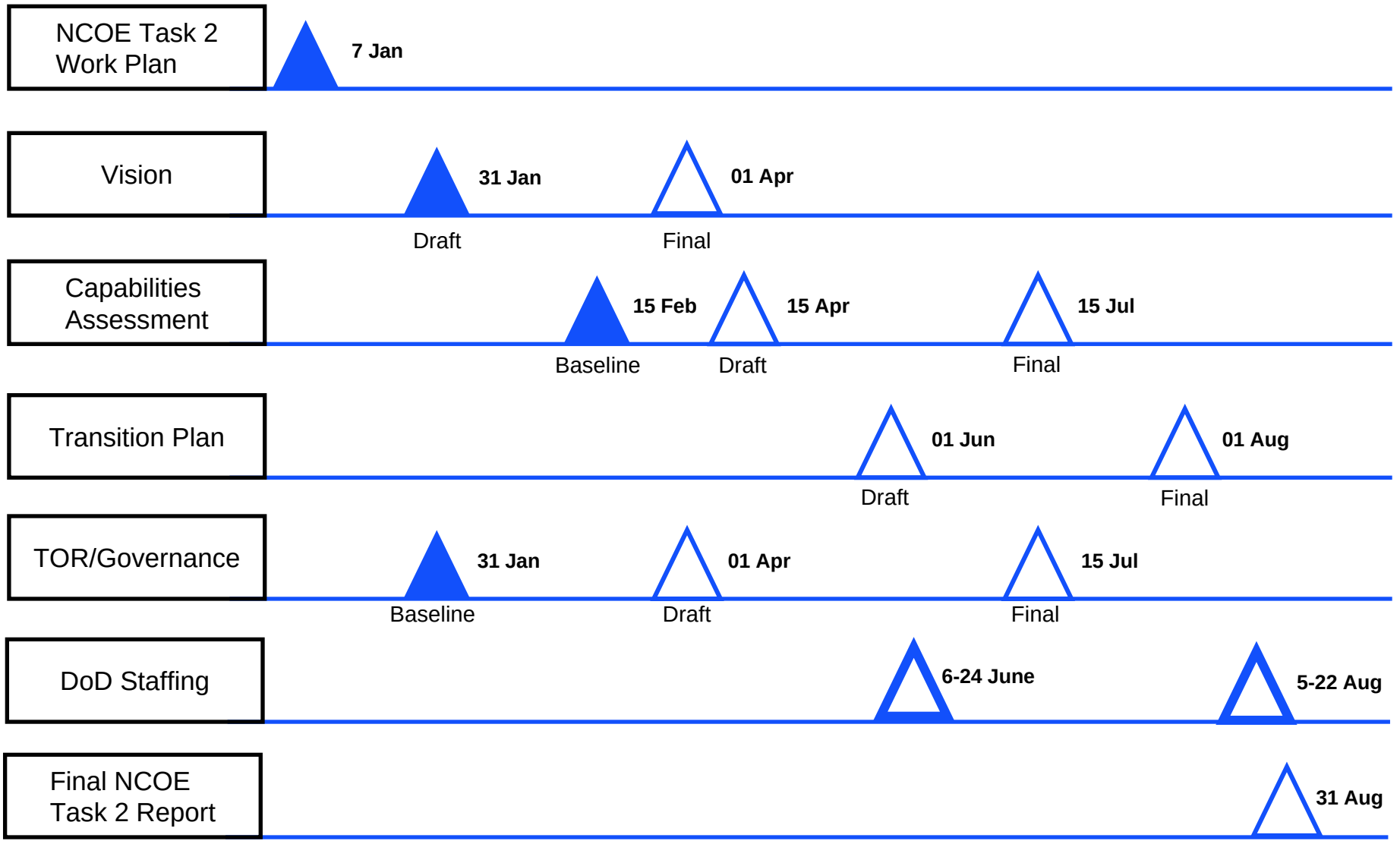
- **Synchronized Schedules**
- **Investment Strategies**
- **Test and Evaluation Strategies**
- **System Engineering Strategies**
- **Configuration Management Strategies**

Governance

- Evaluate current Departmental Roles and Responsibilities (Advocacy, Technical, and Acquisition Oversight):
  - Identify duplicative or conflicting responsibilities
  - Identify roles and responsibilities required but not currently specified
  - Recommend specific modifications to current Unified Command Plans, MIDs, Organizational Charters, and other appropriate DoD and CJCS policies to improve and clarify organization roles and responsibilities

- Define the appropriate governance structure for the NCOE programs

Schedule & Milestones



Implementing a COI Service

Joint COI Data Implementation

CAPT Mike Salvato
USJFCOM J68

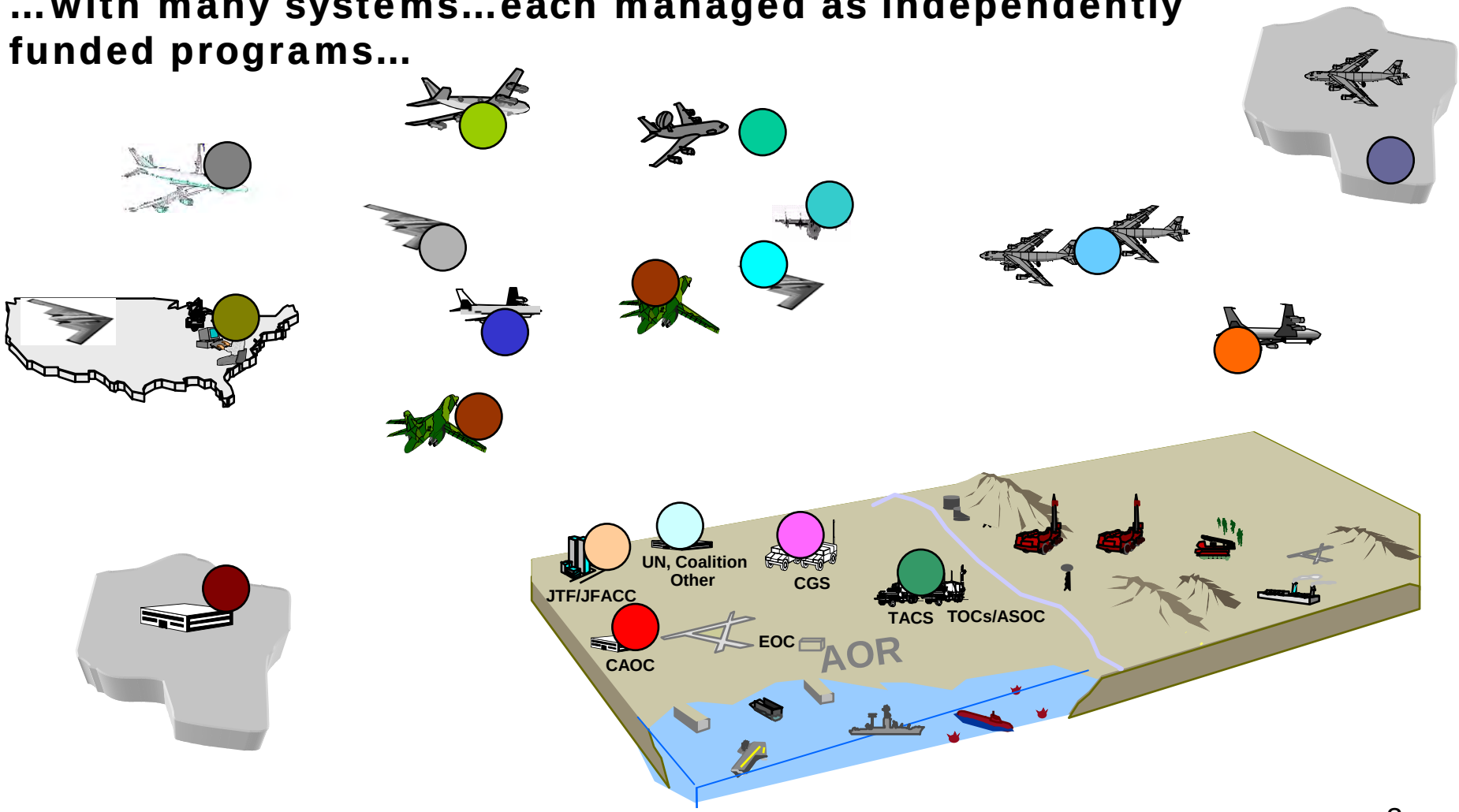
Net Centric Operations, Interoperability & Systems Integration Conference
24 Mar 05

The Joint Battlespace Data Challenge

Many platforms used by multiple services/agencies & coalition partners…

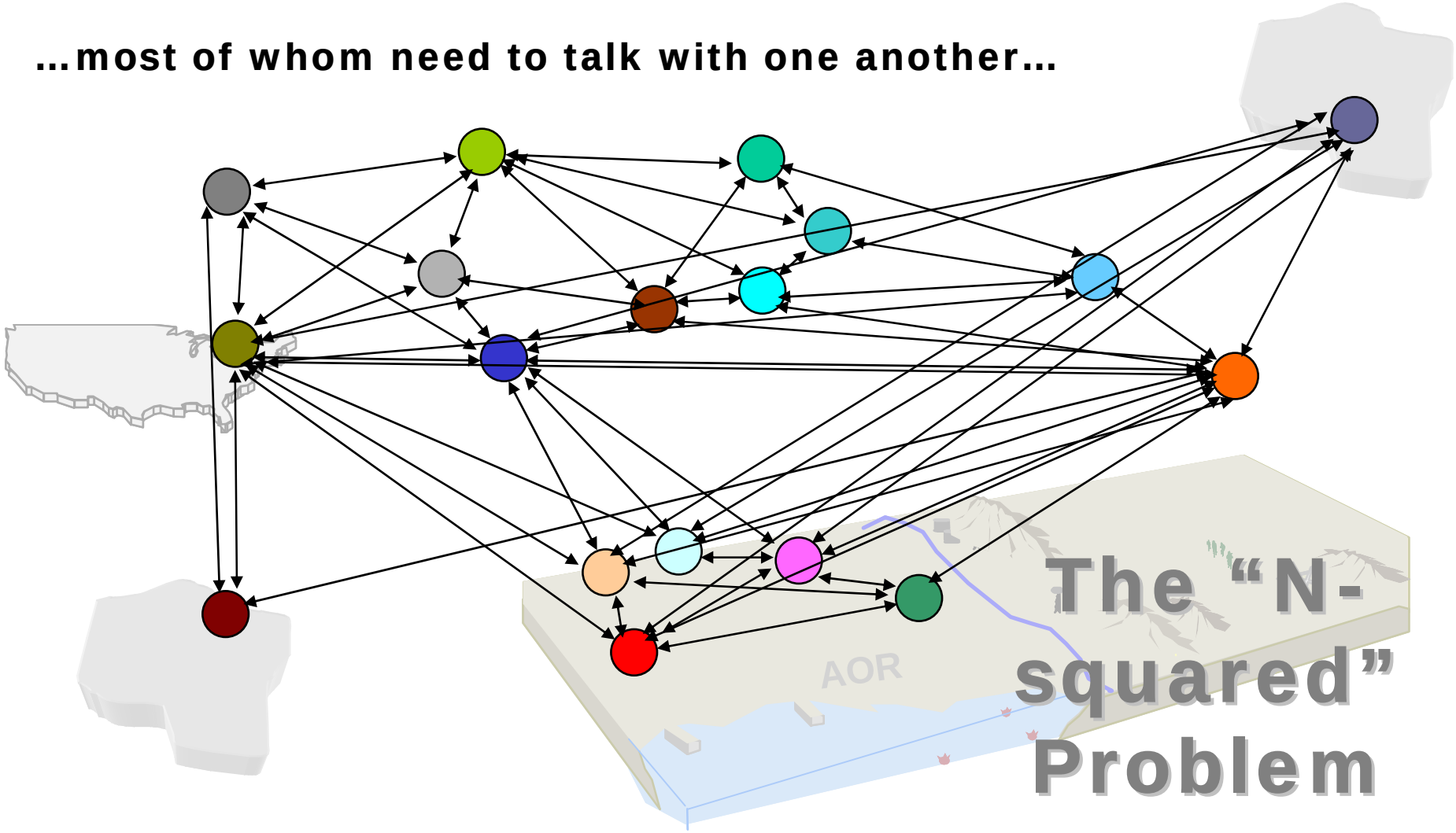
The Joint Battlespace Data Challenge

…with many systems…each managed as independently funded programs…



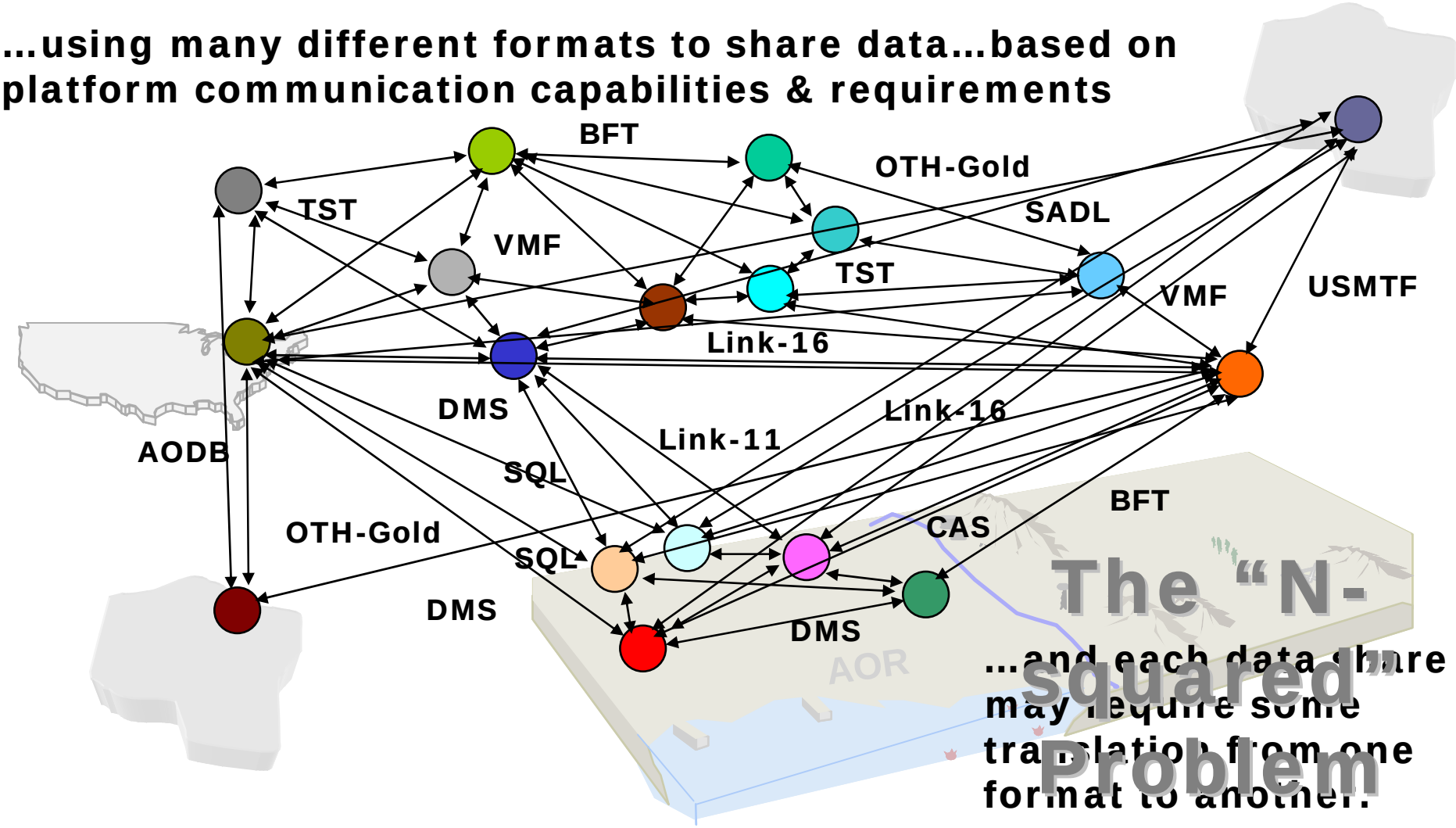
The Joint Battlespace Data Challenge

…most of whom need to talk with one another…



The Joint Battlespace Data Challenge

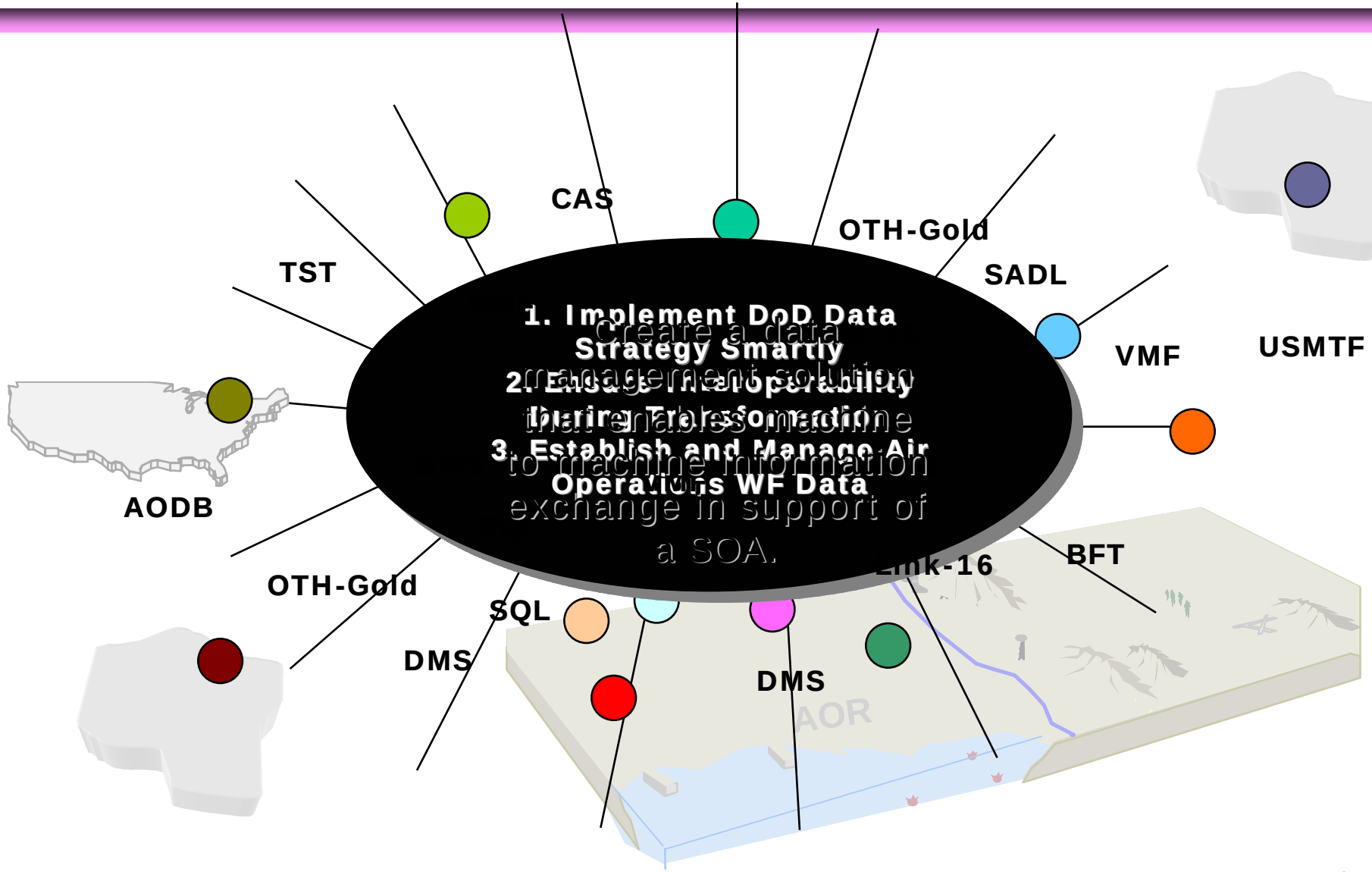
…using many different formats to share data…based on platform communication capabilities & requirements



The "N-squared" Problem

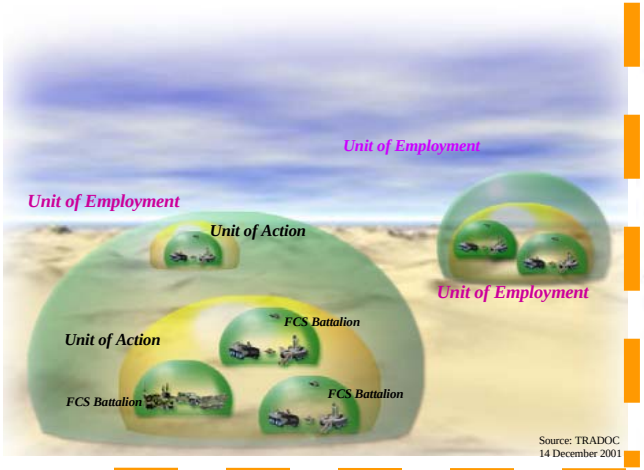
…and each data share may require some translation from one format to another.

The Joint Data Solution



Net-centric Operational Environment

LandWarNet



ConstellationNet

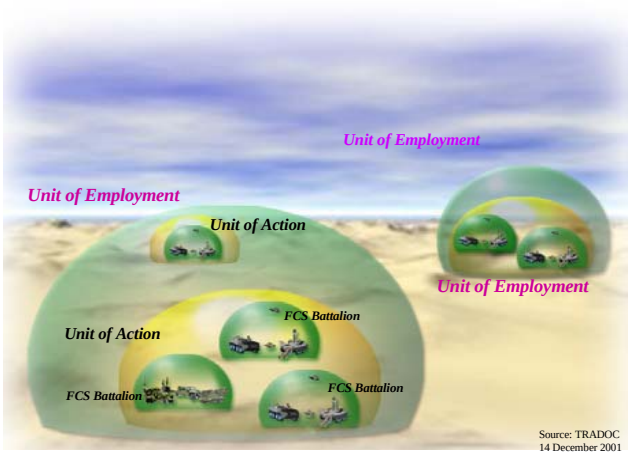
FORCEnet

TSAT, JTRS, GIG-BE, NCES, IA
+ TELEPORT, JNMS

Advancing … from … “point-to-point” to “many-to-many”

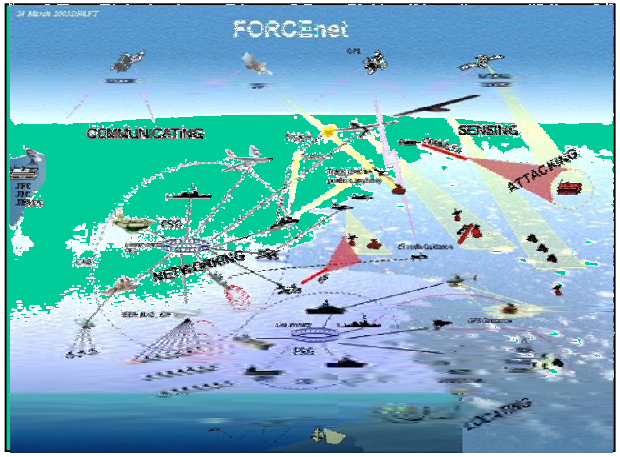
Net-centric Operational Environment

LandWarNet



ConstellationNet

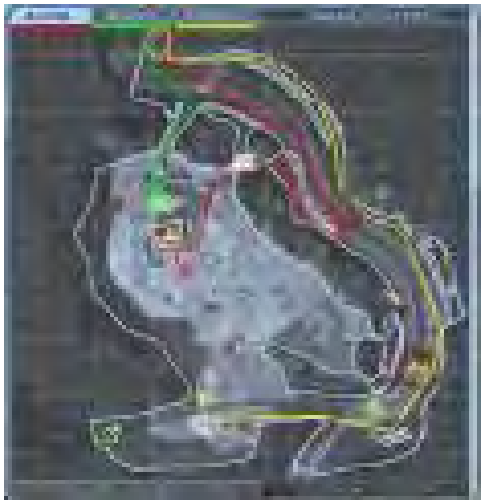
FORCEnet



TSAT, JTRS, GIG-BE, NCES, IA
+ TELEPORT, JNMS

Advancing … from … “point-to-point” to “many-to-many”

Not Just Network Connectivity: Will We Be Blinded by Our Paradigms?



Which is the Authoritative Data Source for Target Location?

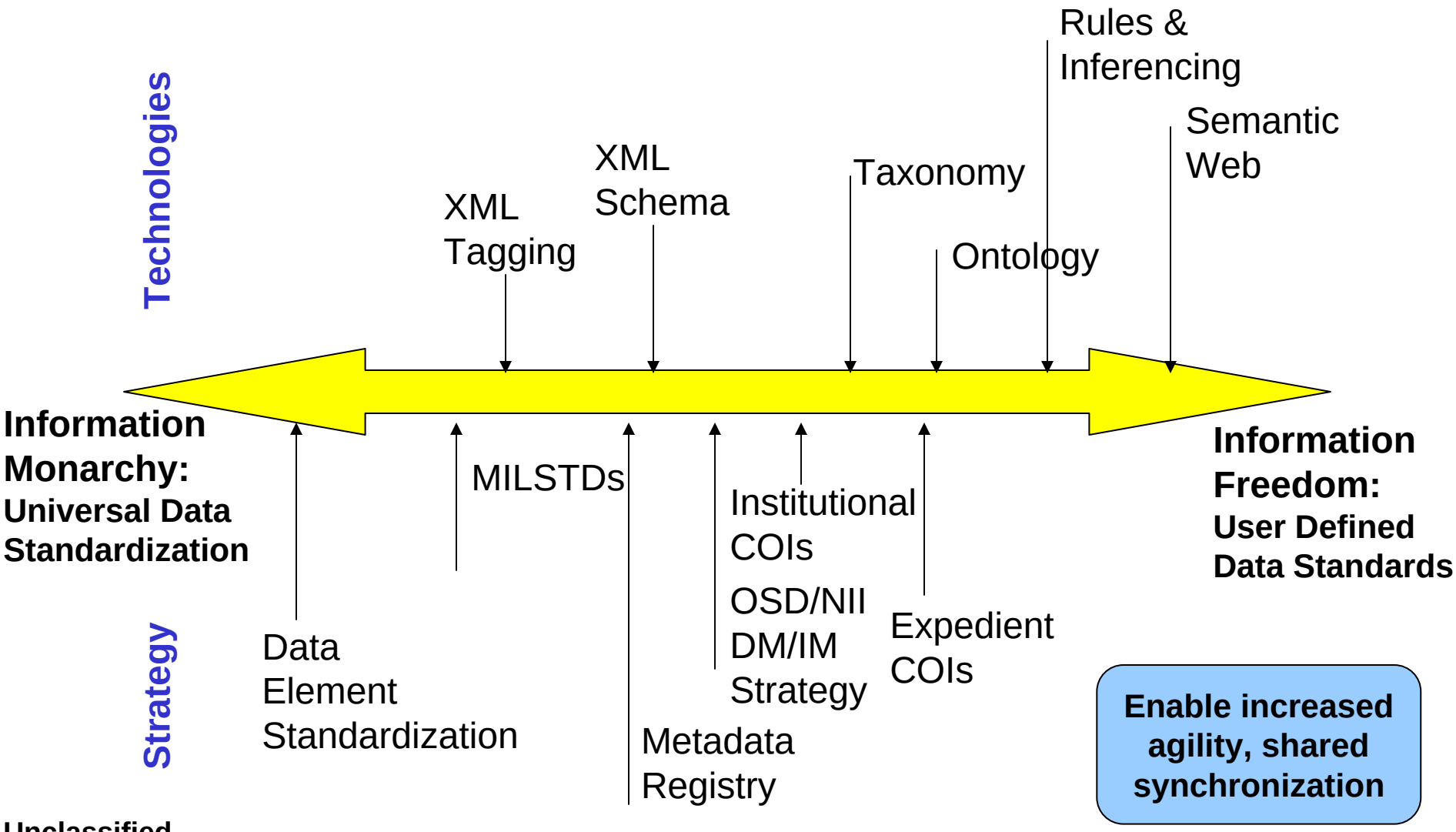
LtCol Jones

CAOC Watch Officer

GySgt Smith

Forward Observer

Achieving a Balance for Data Interoperability



Warfighting Mission Area to Joint Mission Thread Relationship

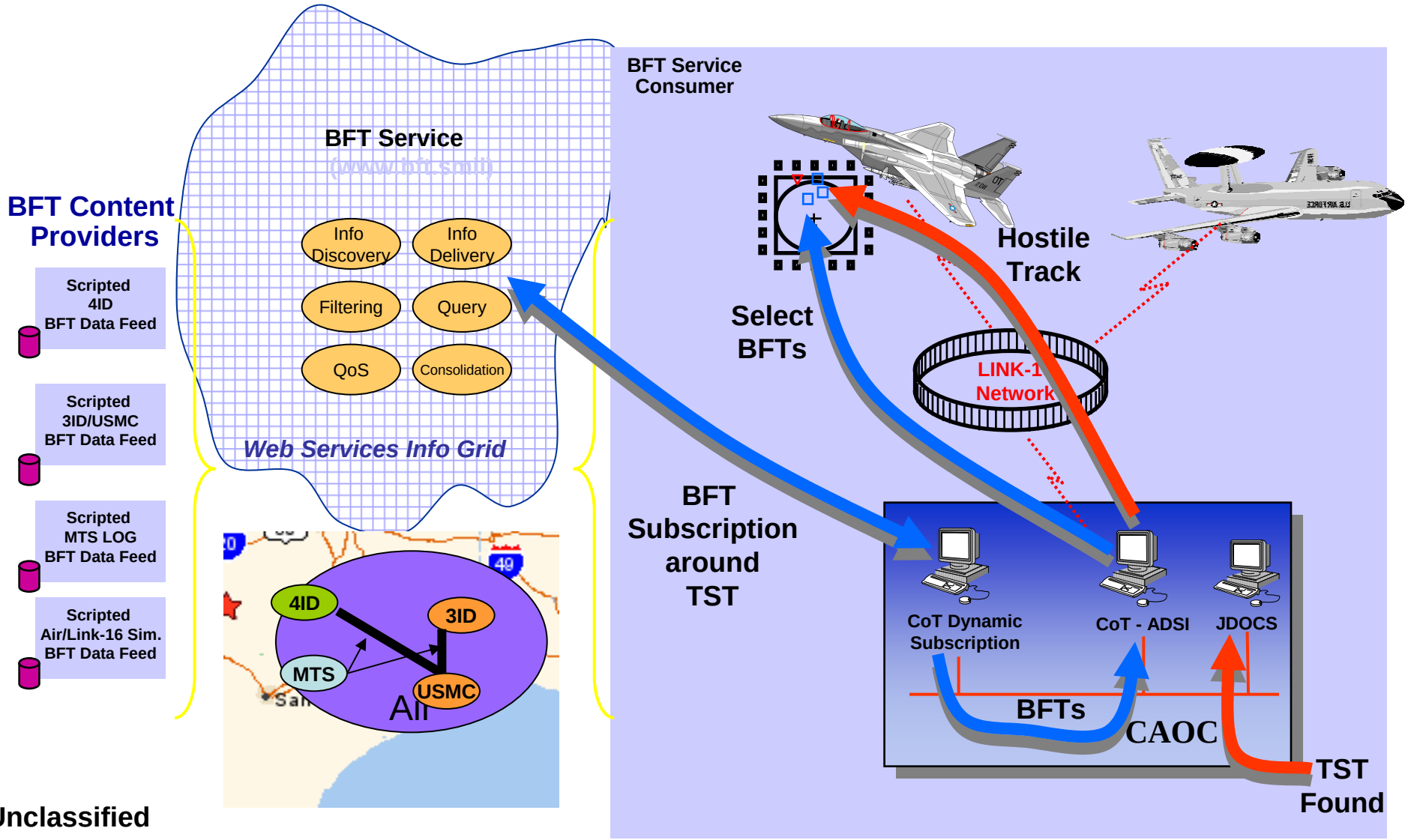
Warfighting Mission Area Governance Forum = MCEB				
Battlespace Awareness (JS J2)	Force Application (JS J8)	Protection (JS J8)	Focused Logistics (JS J4)	Battlespace Communications (JS J6)
COIs GEOINT METOC ▪	COIs GFM ▪ ▪	COIs Missile Defense ▪	COIs ▪ ▪ ▪	COIs Joint C2 ▪ ▪
JBMC2 Joint Mission Threads **Governance Forum = JBMC2 BOD**				
	• JCAS (BFT COI) • Joint Ground Maneuver • Time Sensitive Targeting (TST COI) • Joint Integrated Fires	• Integrated Air/Missile Defense	• Focused Logistics	• Joint Task Force (JTF) C2

Cross-C/S/A initiatives will produce visible, accessible, and understandable data

COI Task Management: Blue Force Tracking Pilot (Draft)

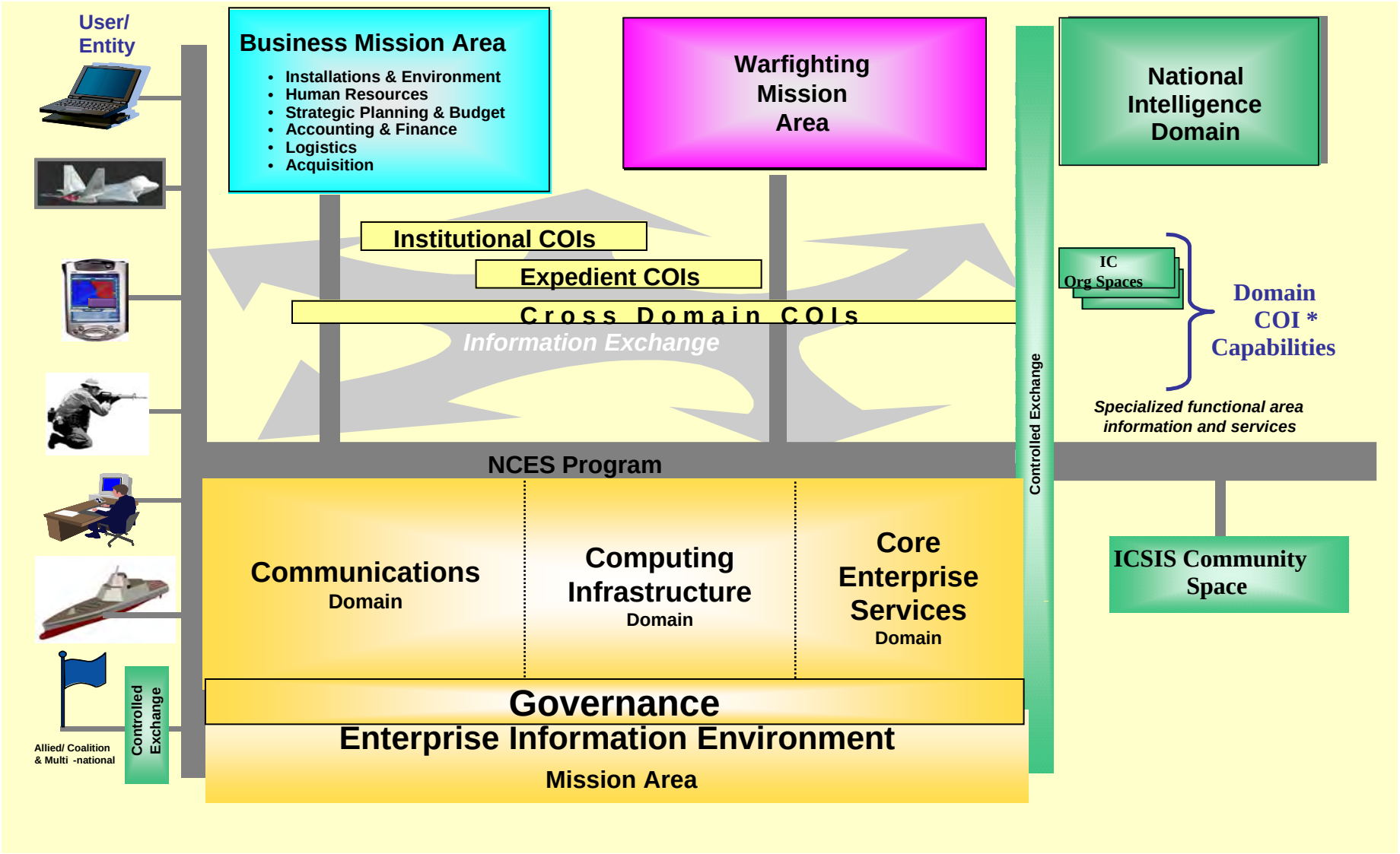
- Build joint vocabulary and XML schema
- Identify authoritative sources compliant with Discovery Meta Data Specification
- Define interface for joint participants to advertise, post and subscribe in a net centric environment
- Use NCES Core Services
- Advertise and post information
- Consumers subscribe/query and develop appropriate integration into their C2 applications

BFT Service in a TST Scenario



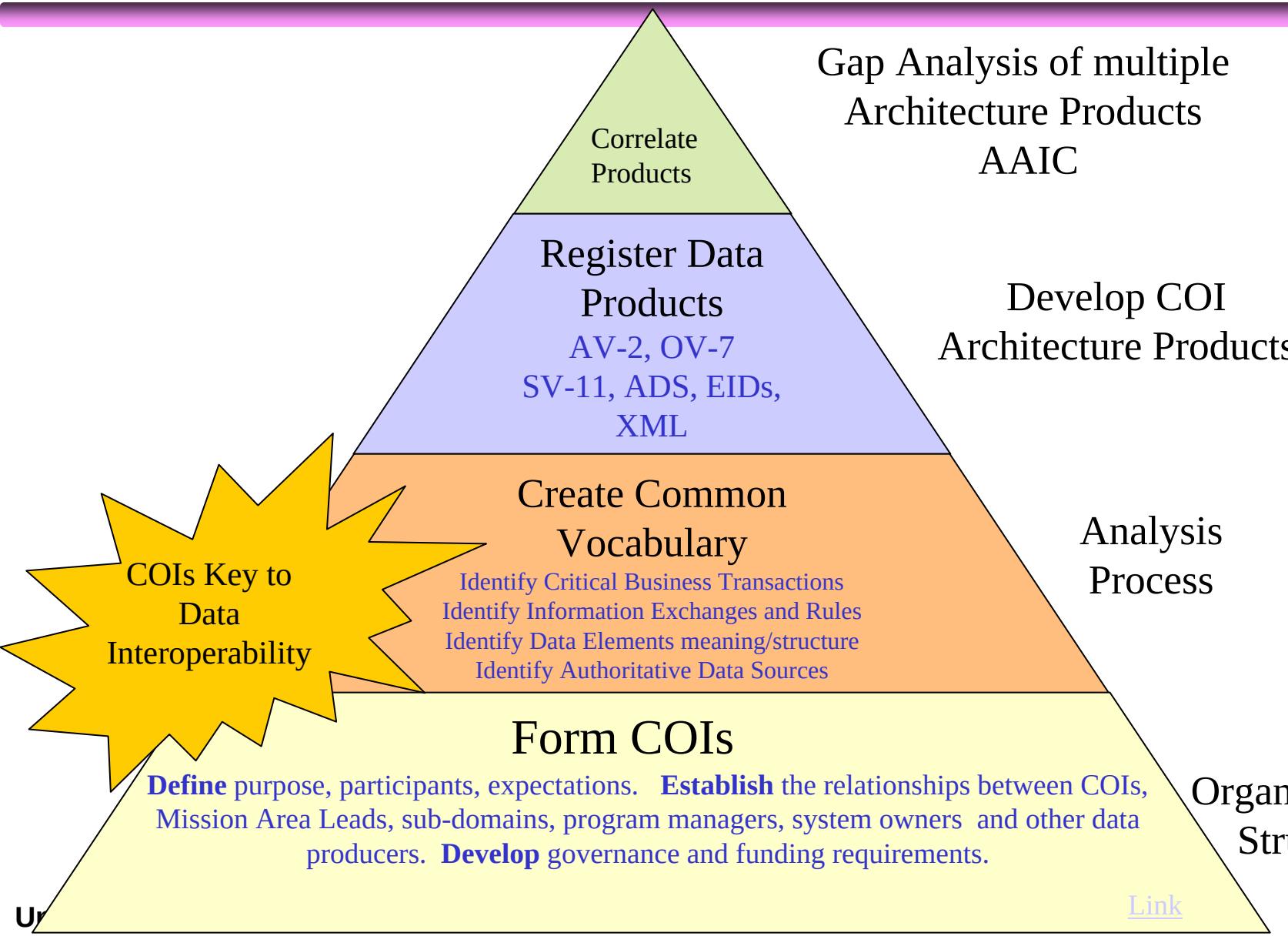
Backup

GIG Enterprise Services Holistic View



* COI: Communities of Interest

Building Toward Shared Data Interoperability



Joint COI Implementation

Service Lead

- ID/prioritize info activities
- Develop/use capabilities
- Champion capabilities to PMs
- Oversee technical approaches

USJFCOM Data Strategy Implementation Team

- Provide COI liaisons
- Technical advice and guidance
- ID Service OPRs
- Synchronize COI efforts

COCOMs/Services/Agencies

- Provide Operators and Technical SMEs
- ID existing/planned info activities
- Incorporate COI capabilities programs
- Synchronize technical approaches

Enterprise Information Environment Mission Area (EIEMA) Panel

Computing Infrastructure Domain Overview

Ms. Maria Samuda

Deputy Manager, CID

OASD(NII)/DoD Deputy CIO

(703) 602-2716, ext. 115 / Maria.Samuda@osd.mil

NDIA Net-Centric Operations, Interoperability & Systems Integration Conference

March 22, 2005

Topics

- **The Computing Infrastructure Domain (CID)**
  - Establishment
  - Tasking
  - Vision and Goals
  - Scope and Definition
- **Challenges and Way Ahead**
  - NDIA Community Involvement

CID Establishment

- **DoD CIO Memo 14 July 2004, Subject: EIEMA Domain Owner Designations**
  - Established EIEMA as DoD Portfolio of programs, projects and systems that deliver and assure the enterprise information environment
  - Four Domains established: Information Assurance (IA), Core Enterprise Services (CES), Communications (Comms), and Computing Infrastructure (CI)
  - Director, Architecture & Interoperability, DASD(DepCIO) assigned as CID Owner

CID Tasking from DoD CIO

- Develop and manage the CID Portfolio
- Use existing JCIDS, PPBES, and DAS
- Use integrated architectures, engineering analysis, and transition plans
- Support establishment of Computing COIs
- Facilitate information sharing
- Establish and maintain CID governance process
- Ensure representation of Service components and other appropriate bodies

CID Vision

Through the use of computing policy, direction, and by influencing DoD capabilities/requirements, resourcing, and acquisition processes* . . .

. . . We envision a Computing Infrastructure supporting the Global Information Grid (GIG) Enterprise and its Mission Areas in the conduct of Net-Centric Operations and Warfare and enabling people throughout a trusted, dependable and ubiquitous network to be empowered by their ability to access data and information.

*JCIDS, PPBES, DAS

A Net-Centric DoD
NII/CIO

Essential Net-Centric *Elements*

- Networked ***Force***
- ***Information*** Sharing
- ***Agility***
- Collaboration
- Sensemaking
- Self-Synchronization

The Force:
- Sensors
- Decision Makers
- Weapons

Shared Awareness & Increased Awareness

Desired Information Attributes:
- Assured
- Available
- Accurate
- Complete
- Reliable
- Timely

Power To The Edge *Principles*

- Post in Parallel (PiP)
- OHIO (only handle information once)
- Smart Pull (not smart push)
- Data Centric (not application)
- Packets (not circuits)
- Dynamic Allocation of Access
- Quality of Service
- Networks that are:
  - End-to-End
  - Encrypted edge-to-edge
  - Minimum Essential Capability

Agility Attributes:
- Robustness
- Resilience
- Responsiveness
- Flexibility
- Innovative
- Adaptability

INTEROPERABILITY

Information Age Tenets

- Robustly Networked Force Improves Information Sharing
- Information Sharing and Collaboration Enhances Quality of Information and Shared Situational Awareness
- Shared Situational Awareness Reduces Operations Cycle Time and Enables Self- Synchronization

All Dramatically Increase *Mission Effectiveness*

- Greater Lethality
- Greater Survivability

CID Definition and Scope

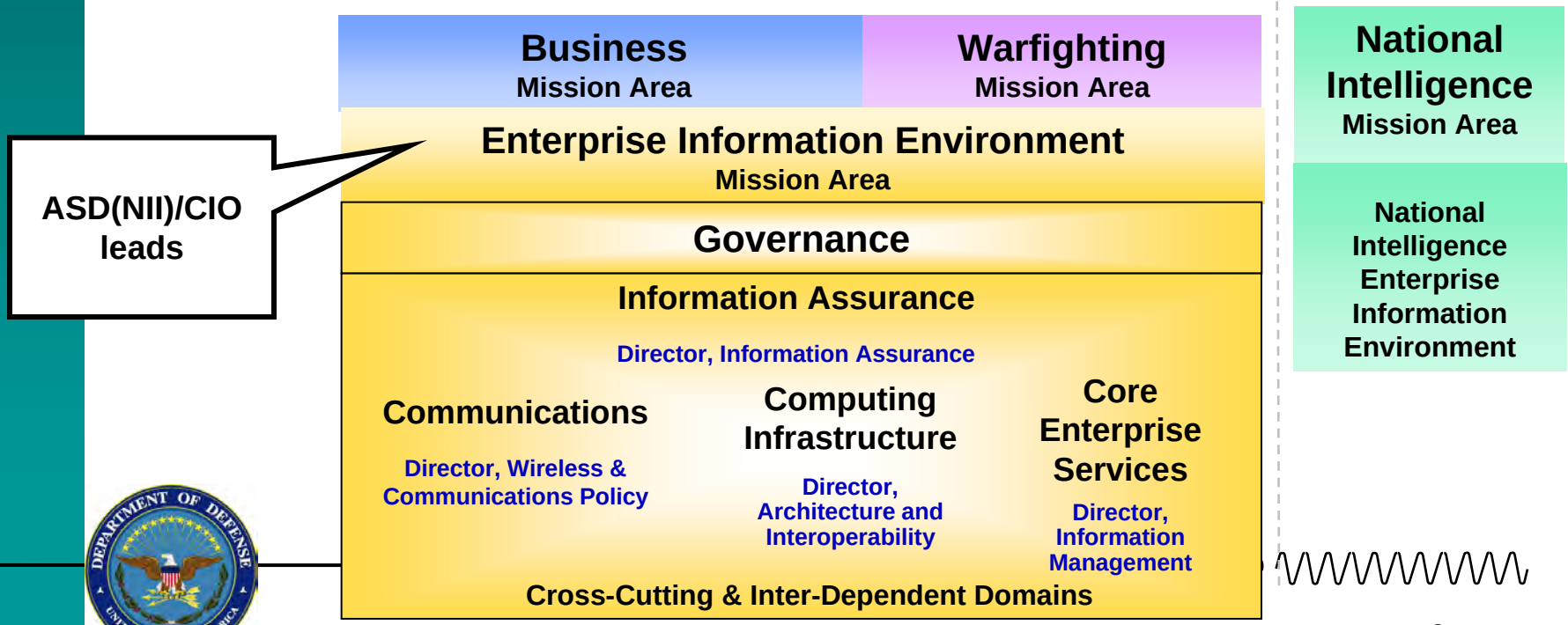
- Defining CID is a challenge
- No definition previously existed
- CID definition is an evolving concept
- Inherent complexities
- EIEMA Domains
  - Some overlap
  - Many instances of “shades of gray”

Complexity of the GIG Enterprise

- Four inter-dependent Mission Areas
- Each Mission Area with its own intra-dependent and inter-dependent Domains

AND, adding to the complexity, EIEMA has:

- Four intra-dependent and inter-dependent EIEMA Domains



Information Technology

OMB Circular No. A-11 Definition of IT:

"Equipment or interconnected system or subsystem of equipment that is used in the automatic . . .

acquisition
storage
manipulation
management
movement
control
display
switching
interchange (transmission)
or reception

. . . of data or information."

Power to the Edge

Information Technology

OMB Circular No. A-11 states:

"Information Technology includes . . .

- computers
  - ancillary equipment
    - software
      - firmware
        - and similar procedures
          - and services
            - including support services
              - and related resources"

CID Is More Than IT

CID must also address:

Computing related **DOTMLPF**

- Doctrine
- Organization
- Training
- Materiel
- Leadership/Management
- Personnel
- Facilities

CID Definition

With the exception of programs, systems, applications, and activities that are developed for specific mission area domains and/or primarily involve the transmission and transport of data or information . . .

The Computing Infrastructure Domain shall consider under its purview any remaining automated system, computer related program or activity, and associated DOTMLPF, that is used in the automatic acquisition, storage, manipulation, management, control, and display of data or information in support of the DoD Mission, with a primary emphasis on hardware, software operating systems, and hardware/software operating systems support.

Activities To Date

- Developed preliminary CID definition and scope
- Appointed government CID technical agent (DISA Computing Services)
- Obtained funding for FY 05 contract support (BAH)
- Identified initial candidate programs and systems for inclusion in the CID Portfolio
- Developing CID governance structure and processes

Emerging CID Challenges

- Domain Definition: Evolving
- Cross-Mission Area, Cross-Domain Area Issues
- Establishing the CID COI
- Acceptance of governance structure and processes
- Portfolio Management – Analysis, Selection, Evaluation
- Impacting JCIDS, PPBES, DAS
- Developing the CID Strategy and Roadmap
- Developing DoD Computing Policy

Network Centric Operations Urban Warfare

National Defense Industrial Association
Net Centric Operations, Interoperability & Systems Integration Conference

Presented by Fred Stein
MITRE
fstein@mitre.org

The Results - Unpredictable Engagements – Interdependence

Agility is the Key Measurement

Sensor input linked to
Command Center

Imarsat (V)
Iridium (V)
UHF TAC SAT (V/D)
Laser Rangefinder - GPS
Locates Target for engagement

C2 Center request more
Data to task weapons
Platform
Link 16 (D)
UHF Sat (V)
Combat Track II (D)

Link 16 (D)
Radar (D)
UFH (v)
Mensurate Target

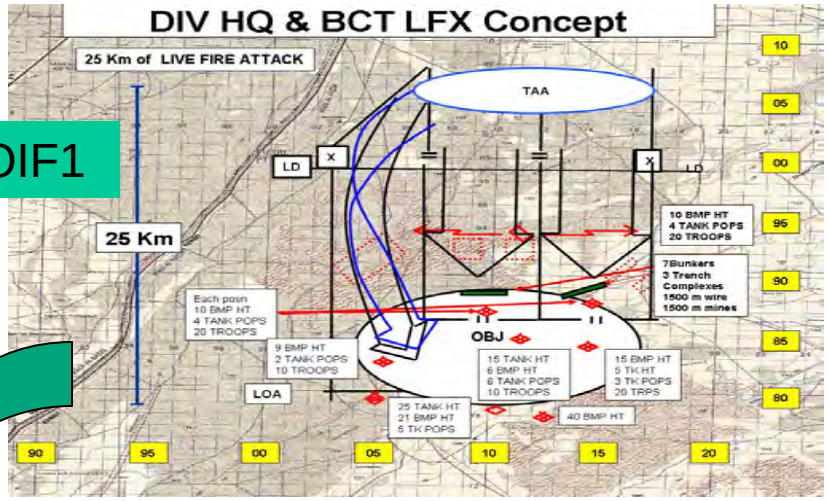
Final Link To Target GPS (D)

UHF (V)
Combat Track II (D)
Keyboard to Bomb
Engages Targets

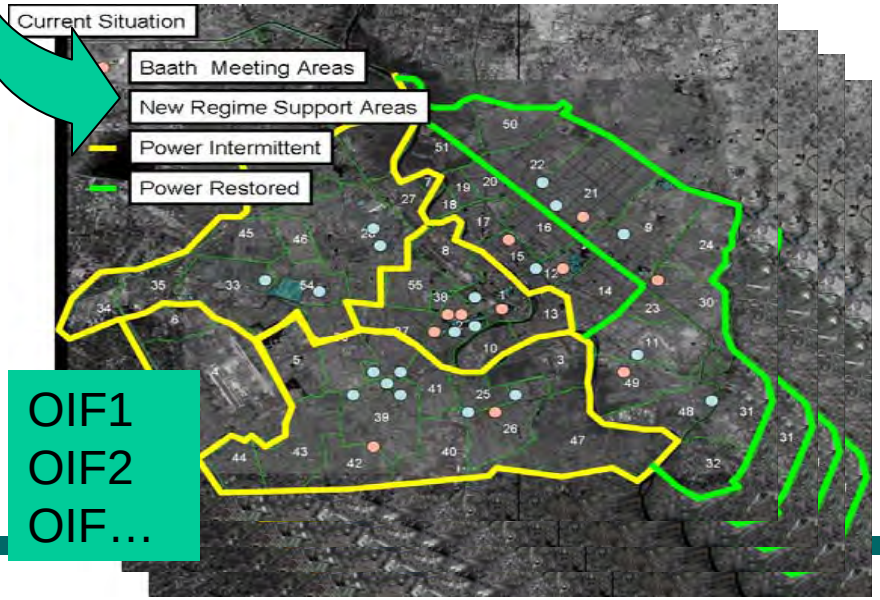
Global Trends

Celebrity magazines have encouraged readers to snap the famous on their camera phones AP

Rapid Transition Calls for Flexible C2 Capabilities

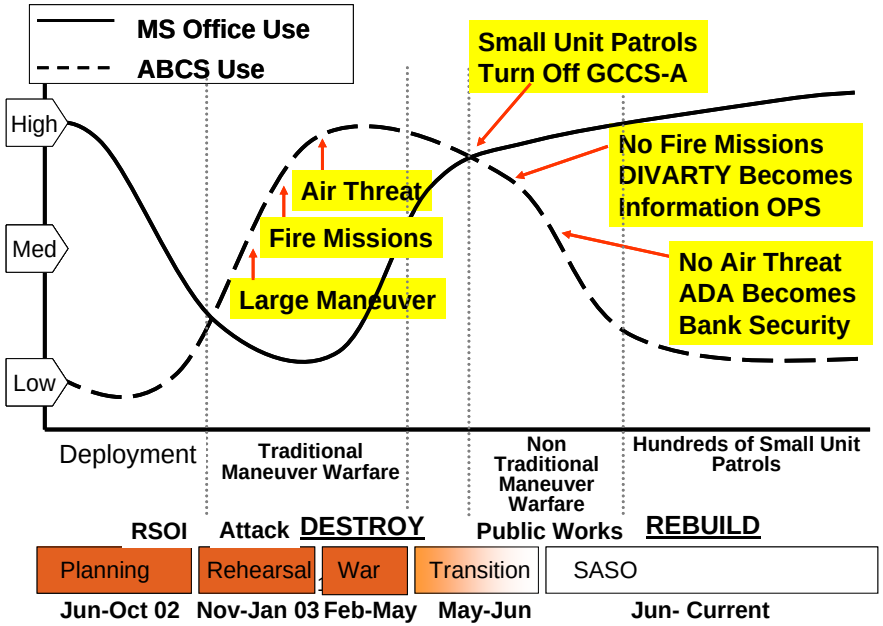


OIF1



OIF1
OIF2
OIF…

Change Mission Vs Usage



Change in Emphasis Areas in SASO

- Public Works (Water/Power…)
- Patrols
- Insurgent Strong Points, Tracking, Trend Analysis
- Local Population Attitude
- "Mayor" type duties
- Food/Water Distribution

Urban Warfare Then and Now

- Coalition Forces in Iraq destroy insurgents/terrorists with limited impacts on cities and low loss of life and equipment
- Conducting warfare with network enabled capabilities
  - Technology
    - Leveraging ISR assets all types of UAVs for ISR and engagements – Integrating ISR and C2 systems with weapons systems
    - Linking ground night vision capabilities to air delivered effects
    - Moving toward persistent ISR
  - Tactics
    - Use of small probing actions to bring enemy out and then destroy
    - Back the enemy into an increasing smaller area

Coalition Operations in Fallujah

Coalition Operations in Fallujah

- The battle for this urban maze will be largely a battle for line of sight – Battle for Information
- Marines possess imaging devices, comms ,computers – part of the Infrastructure Grid, range finders – part of the Sensor Network and their rifles – Part of the Engagement Network
- Their role as sensors maybe more damaging then their role as engagers - key is Information though ***observation***.

Recent Fallujah Examples

1. Abrams Tanks Commander observed a group of enemy through the optical sight of his tank at 2,400 meters – Sensor network
2. Enemy started throwing Molotov cocktails and pouring gasoline on the road to create a smokescreen… thought the smoke would obscure them from view.
3. Constraints of firing into another AOR, where US marines might be operating, and the danger of damaging the mosque, which would have provoked outrage in the Arab world,
4. Required authorized at a more senior level.

5. A Humvee from Phantom troop fitted with a Long Range Acquisition System (LRAS) was moved to within two kilometers of the mosque, to provide more detail Senor Network
6. Plt Leader was asked to provide a grid co-ordinate, accurate to within a meter, to minimize the chance of hitting the mosque, about 50 meters from the building.
7. Authorization came through and the order to fire a barrage of 20 155mm high-explosive shells from howitzers about three miles away from the mosque. Engagement network
8. Soldier manning the LRAS, watched the burst of shells hit .BDA

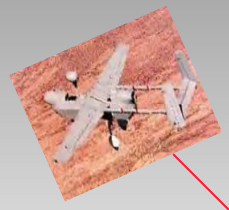
Bottom Line

- **U.S. forces are networking their sensors from those on the tanks to UAVs to Command all were exploited to gain an information advantage.**

- **The information infrastructure grid linked these sensors to the decision makers and ultimately to the engagement network from whose assets the target was matched.**

- **What is clear in these examples are the Flexibility and Agility of the U.S. forces enablered by the Infrastructure Grid while conducting Network Centric Operations**

Urban NCW Capability



- Cmd requests that Sniper to laser mortar firing location.
- Apache/Harrier/ AUAV vectored to enroute target.
- Terrorists fire mortar fires and then moves toward sanctuary.
- Firefinder radar detects location of mobile mortar.

NC Integration of systems to engage Urban Targets Infantry Shooting Mortar

C2 via AFTADS / CPOF TACSAT/FM

- Target successfully engaged and destroyed

Questions?

Network Centric Operations
Urban Warfare

National Defense Industrial Association
Net Centric Operations, Interoperability & Systems Integration Conference

Presented by Fred Stein

The Results - Unpredictable Engagements – Interdependence

Agility is the Key Measurement

Sensor input linked to Command Center

Imarsat (V)
Iridium (V)
UHF TAC SAT (V/D)
Laser Rangefinder - GPS
Locates Target for engagement

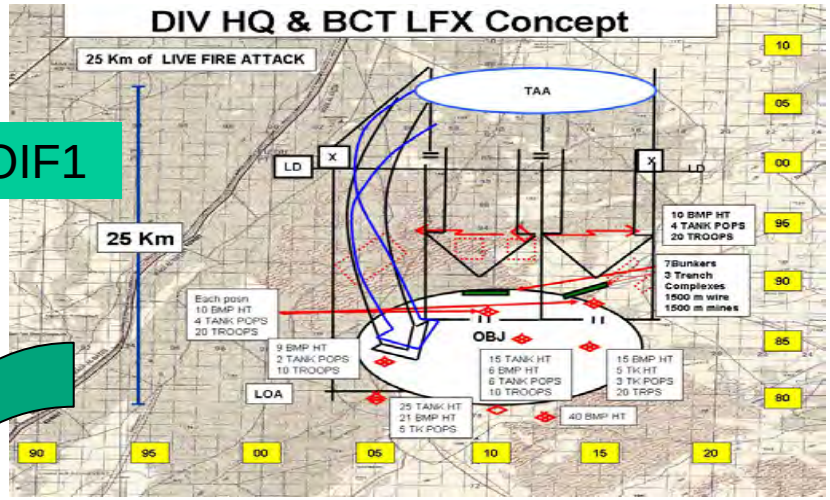
C2 Center request more Data to task weapons Platform
Link 16 (D)
UHF Sat (V)
Combat Track II (D)

Link 16 (D)
Radar (D)
UFH (v)
Mensurate Target

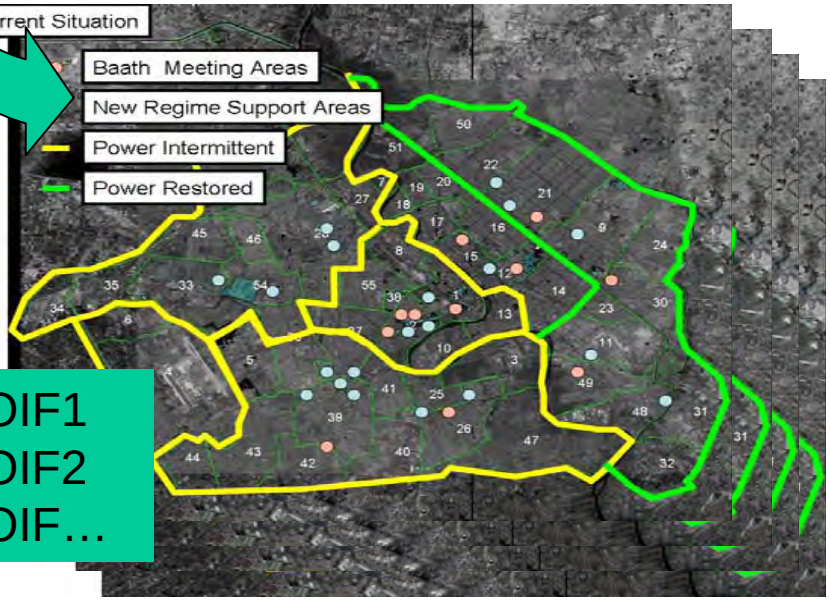
Final Link To Target GPS (D)

UHF (V)
Combat Track II (D)
Keyboard to Bomb
Engages Targets

Rapid Transition Calls for Flexible C2 Capabilities

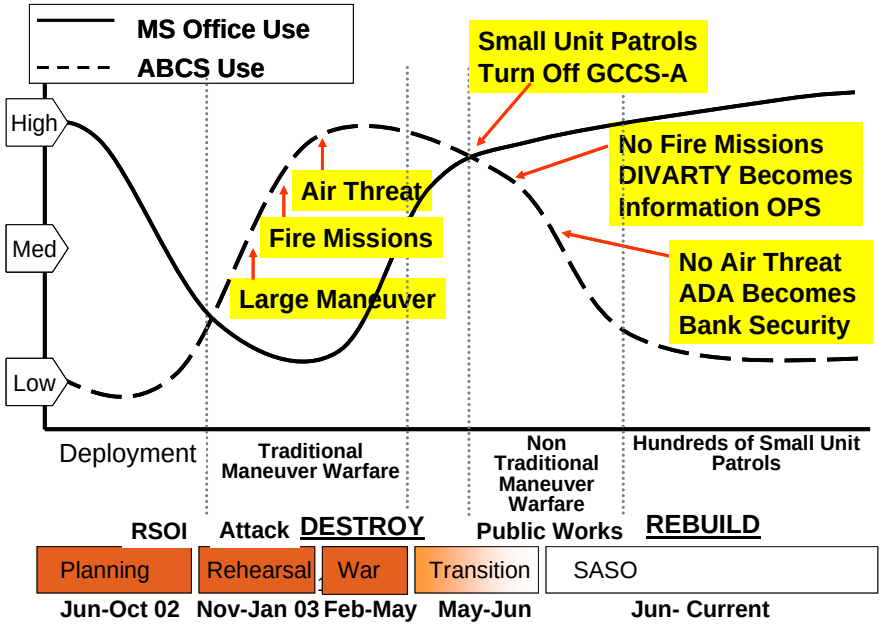


OIF1



OIF1
OIF2
OIF…

Change Mission Vs Usage



Change in Emphasis Areas in SASO

- Public Works (Water/Power…)
- Patrols
- Insurgent Strong Points, Tracking, Trend Analysis
- Local Population Attitude
- "Mayor" type duties
- Food/Water Distribution

Urban Warfare Then and Now

- Coalition Forces in Iraq destroy insurgents/terrorists with limited impacts on cities and low loss of life and equipment
- Conducting warfare with network enabled capabilities
  - Technology
    - Leveraging ISR assets all types of UAVs for ISR and engagements – Integrating ISR and C2 systems with weapons systems
    - Linking ground night vision capabilities to air delivered effects
    - Moving toward persistent ISR
  - Tactics
    - Use of small probing actions to bring enemy out and then destroy
    - Back the enemy into an increasing smaller area

Coalition Operations in Fallujah

Coalition Operations in Fallujah

- The battle for this urban maze will be largely a battle for line of sight – Battle for Information
- Marines possess imaging devices, comms ,computers – part of the Infrastructure Grid, range finders – part of the Sensor Network and their rifles – Part of the Engagement Network
- Their role as sensors maybe more damaging then their role as engagers - key is Information though ***observation***.

Recent Fallujah Examples

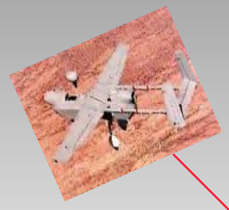
1. Abrams Tanks Commander observed a group of enemy through the optical sight of his tank at 2,400 meters – Sensor network
2. Enemy started throwing Molotov cocktails and pouring gasoline on the road to create a smokescreen… thought the smoke would obscure them from view.
3. Constraints of firing into another AOR, where US marines might be operating, and the danger of damaging the mosque, which would have provoked outrage in the Arab world,
4. Required authorized at a more senior level.

5. A Humvee from Phantom troop fitted with a Long Range Acquisition System (LRAS) was moved to within two kilometers of the mosque, to provide more detail Senor Network
6. Plt Leader was asked to provide a grid co-ordinate, accurate to within a meter, to minimize the chance of hitting the mosque, about 50 meters from the building.
7. Authorization came through and the order to fire a barrage of 20 155mm high-explosive shells from howitzers about three miles away from the mosque. Engagement network
8. Soldier manning the LRAS, watched the burst of shells hit .BDA

Bottom Line

- **U.S. forces are networking their sensors from those on the tanks to UAVs to Command all were exploited to gain an information advantage.**
- **The information infrastructure grid linked these sensors to the decision makers and ultimately to the engagement network from whose assets the target was matched.**
- **What is clear in these examples are the Flexibility and Agility of the U.S. forces enablered by the Infrastructure Grid while conducting Network Centric Operations**

Urban NCW Capability



- Cmd requests that Sniper to laser mortar firing location.
- Apache/Harrier/ AUAV vectored to enroute target.
- Terrorists fire mortar fires and then moves toward sanctuary.
- Firefinder radar detects location of mobile mortar.

NC Integration of systems to engage Urban Targets Infantry Shooting Mortar

C2 via AFTADS / CPOF TACSAT/FM

- Target successfully engaged and destroyed

Questions?

Headquarters U.S. Air Force

Integrity - Service - Excellence

JBMC2 Convergence

Col Keith Trouwborst

Chief, C4ISR Integration, Concepts & Policy Division

Warfighting Integration

U.S. AIR FORCE

March 2005

U.S. AIR FORCE

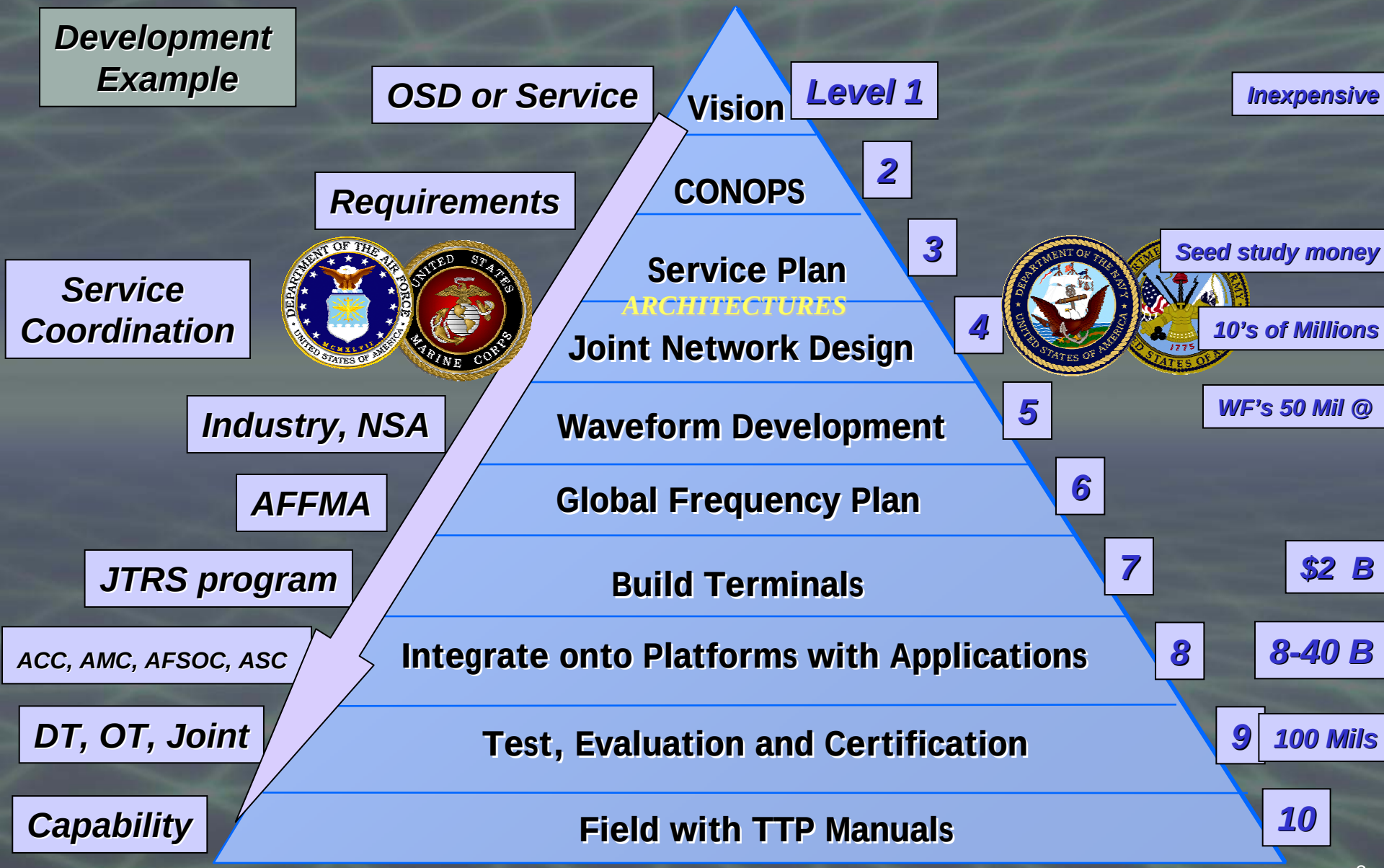
Commitment

The Air Force is fully engaged in co-developing integrated capabilities to deliver Joint effects by significant investment in time, resources, and people to advance Joint Net-Centric Capability

Requires:

- Air, Terrestrial & Space Integration
- Proactive, Sequential Steps to Field Capabilities
- Adapting our Culture, Organization, Training, and Doctrine

JBMC2 CONVERGENCE REQUIRES JOINT NETWORK-CENTRIC CAPABILITY

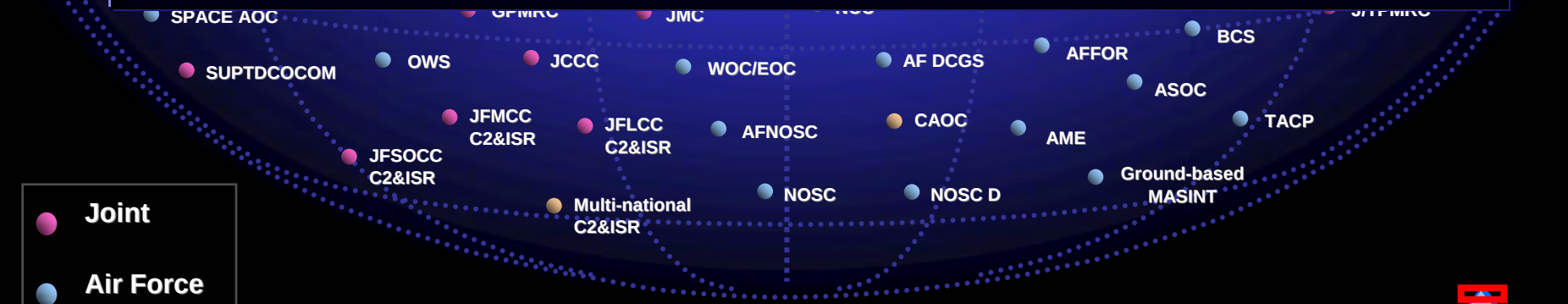


The C2 Constellation

- Peer-based Net-Centric Infostructure
- Shared combat information environment to C2 Centers
- Seamless, information dissemination grid
- Through C2ISR Nodes, achieving connectivity standards

In 3 stages:

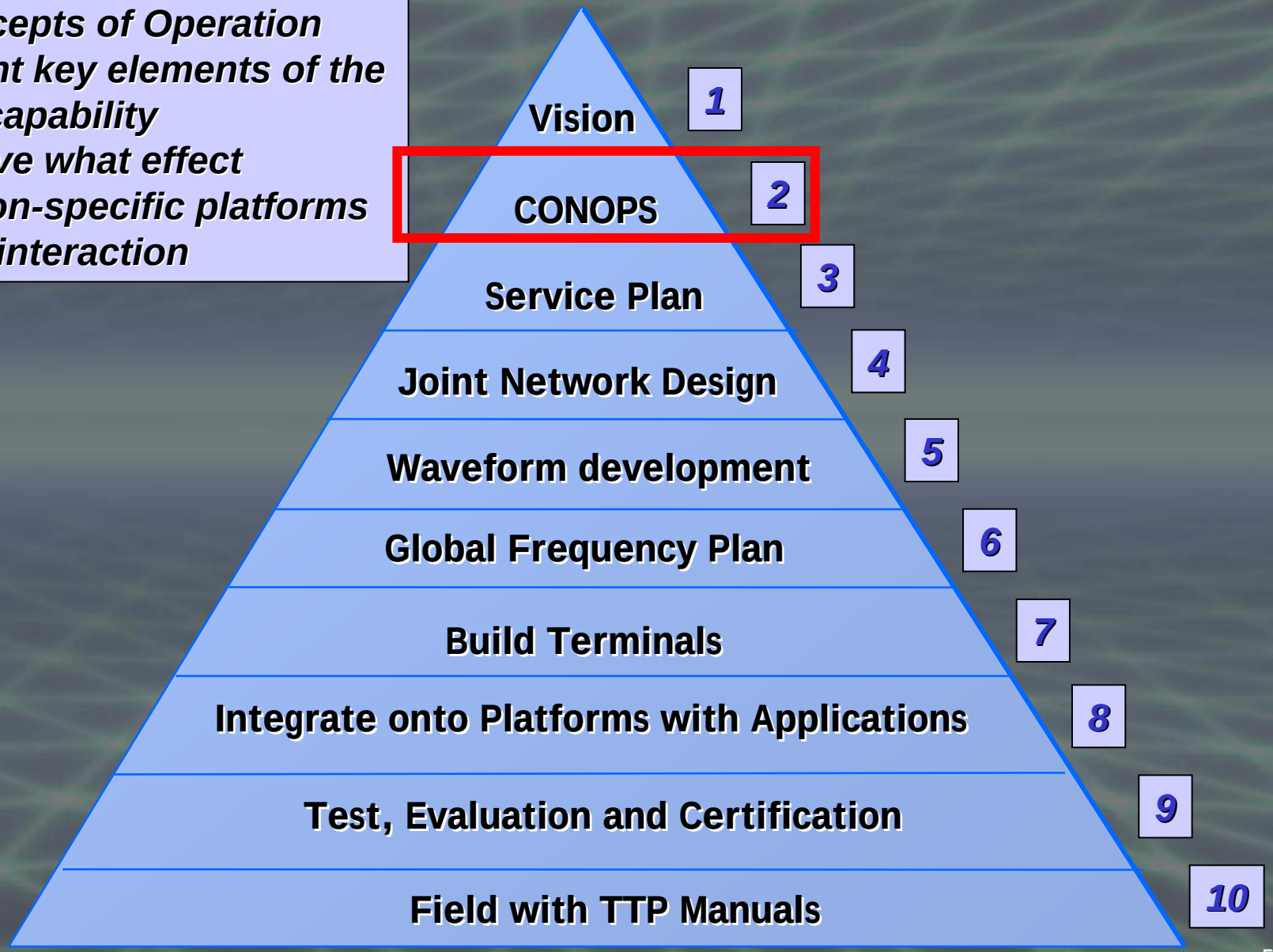
Architecture for standards / protocols
Bringing legacy systems to constellation configuration protocols
Fielding Next Generation Advanced C2 Sensors



Elements to Develop Joint NCW Capability

USAF Concepts of Operation

- ***Document key elements of the desired capability***
- ***To achieve what effect***
- ***Which non-specific platforms***
- ***Do what interaction***

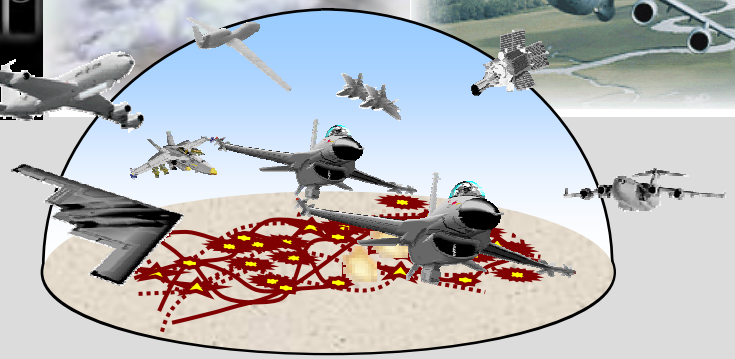


Capabilities-Based CONOPS

Global Power

Global Reach

Global Vigilance



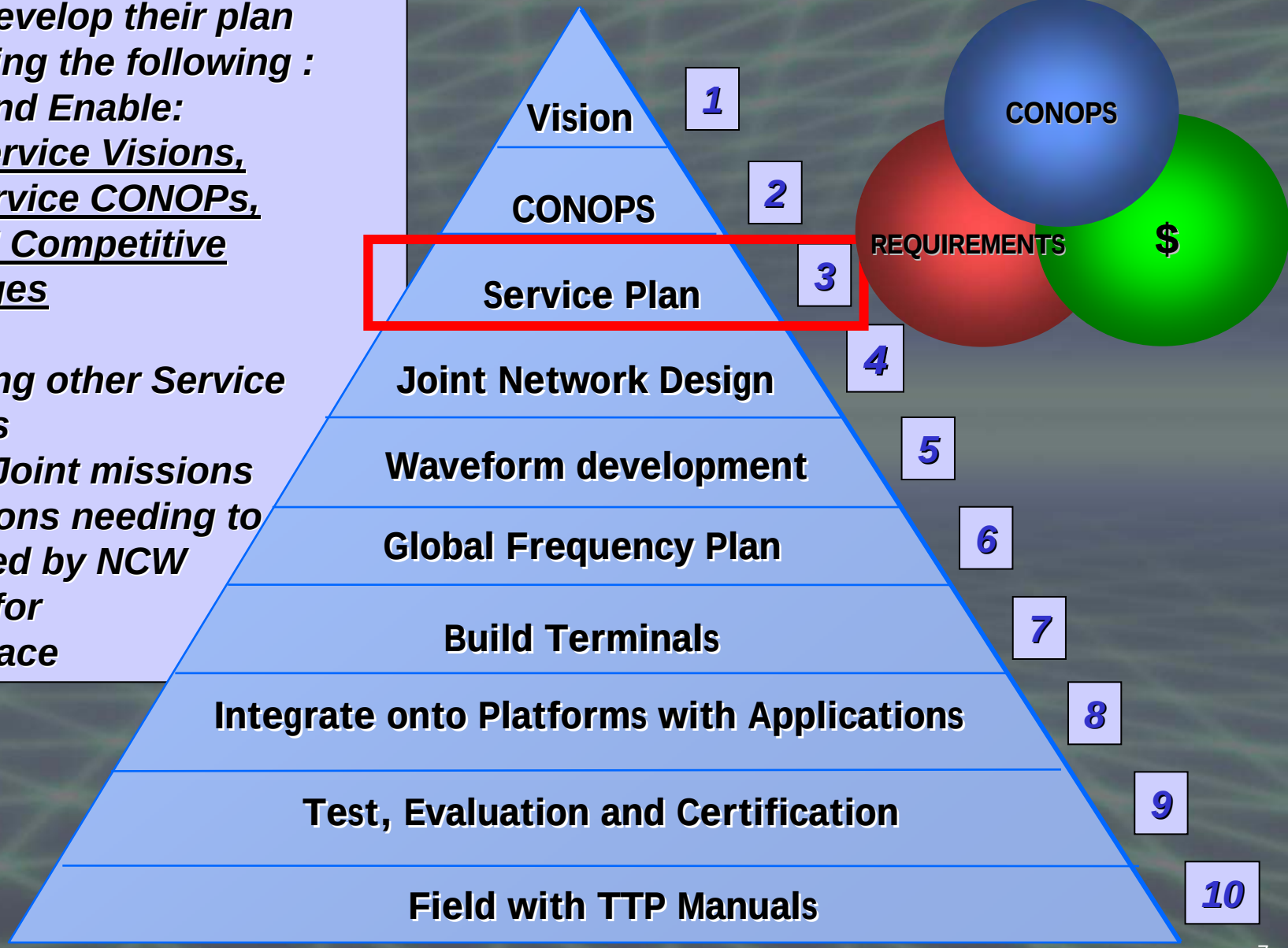
CONOPS

- Global Strike CONOPS
- Homeland Security CONOPS
- Global Mobility CONOPS
- Global Persistent Attack CONOPS
- Nuclear Response CONOPS
- Space & C4ISR CONOPS

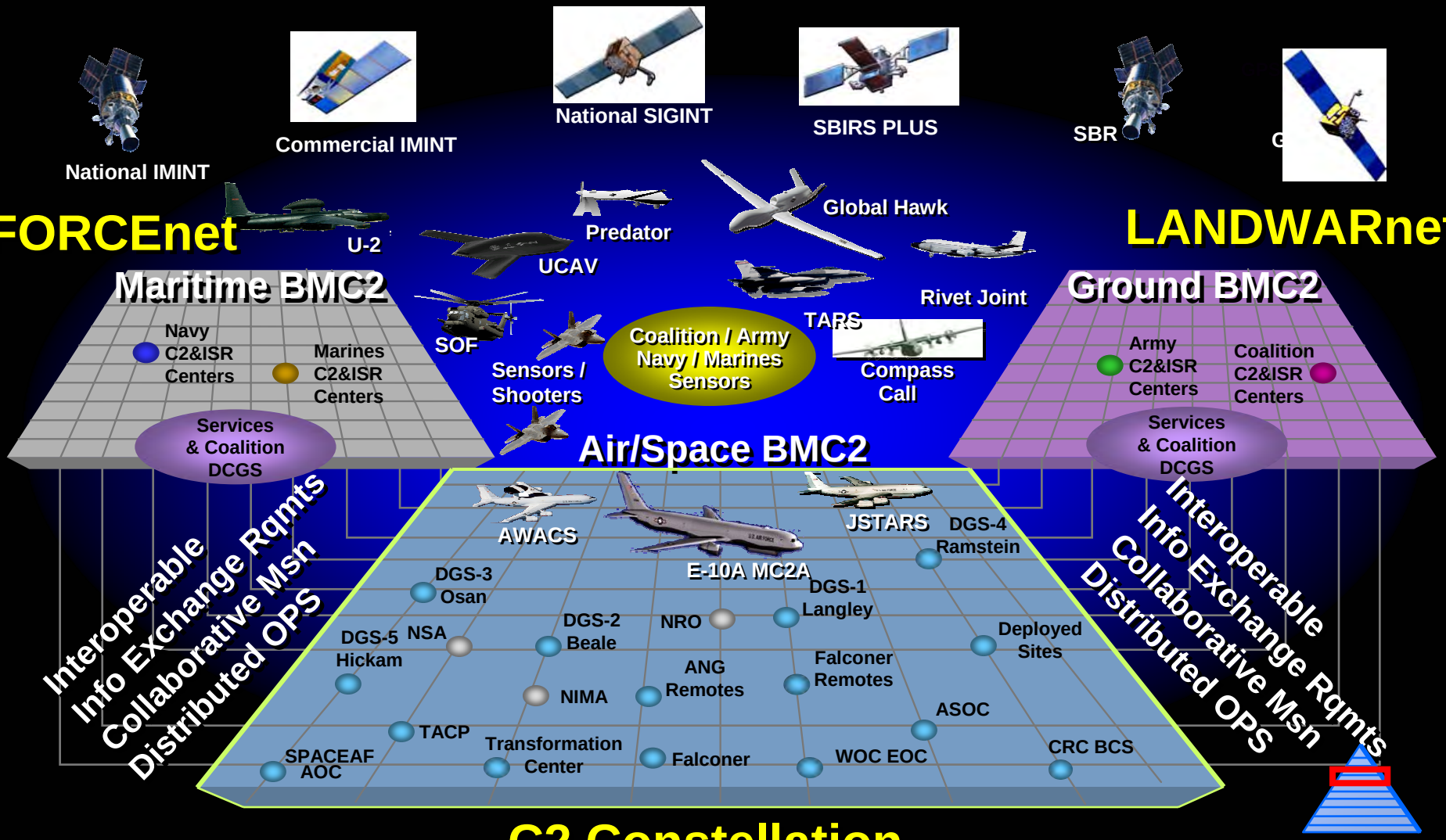
Elements to Develop Joint NCW Capability

Services develop their plan considering the following :

- *Accent and Enable: <u>Other Service Visions, Other Service CONOPs, Services' Competitive Advantages</u>*
- *Key on :*
- *Leveraging other Service Strengths*
- *Specific Joint missions*
- *Applications needing to be enabled by NCW*
- *Looking for Trade Space*

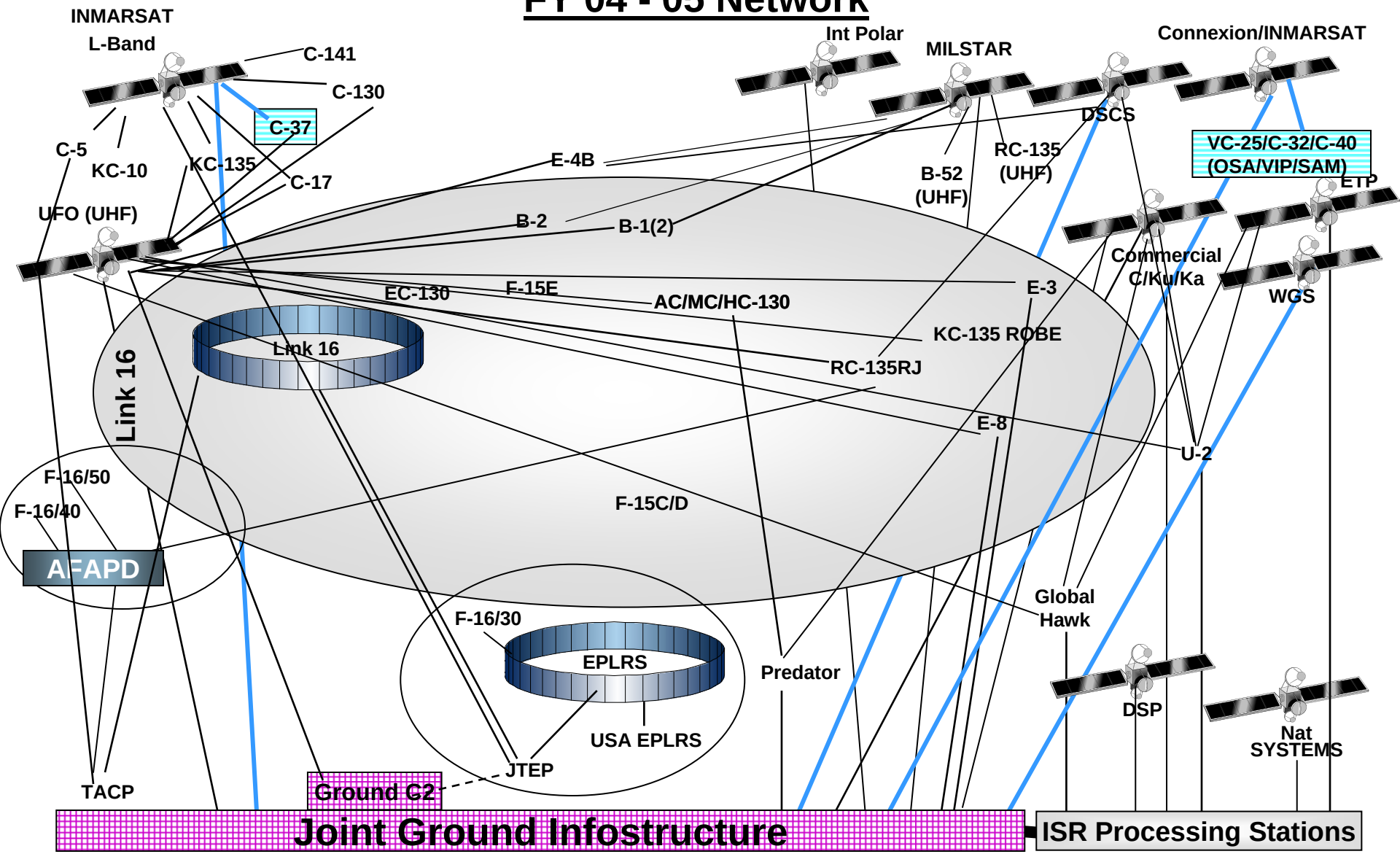


Constellation Interoperates with Maritime & Ground BMC2 Systems to Provide Joint BMC2



C2 Constellation

FY 04 - 05 Network



No IP/Data Link Capability:			
F-117	B52	A/OA-10	RC-135S
RC-135U	C-130E/H/J	C-9	KC-135
KC-10	B-1(58)	E-4B	HH-60

Future platforms:	
E-10	ABL
F/A-22	F-35 (JSF)
UCAV	KC-767A

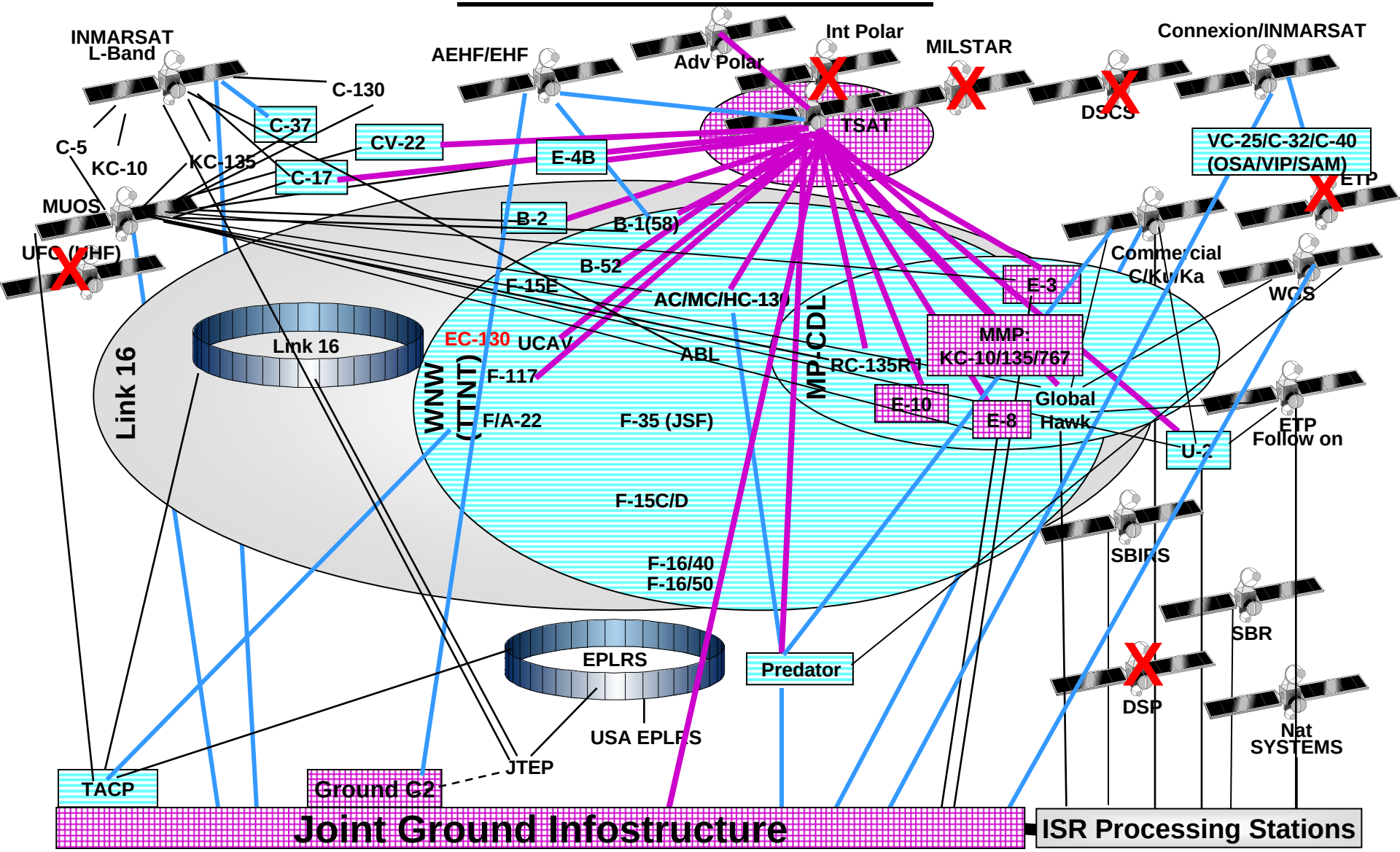
Joint IP Dynamic Routing

IP Addressable

X Decommissioned

RED TEXT = Added Platform

Envisioned FY18 Network



No IP/Data Link Capability:

RC-135S	RC-135U
C-130E/H/J	C-9
KC-135 (445)	

Benefits:

Individual Messaging Vice Broadcast
Self-forming Network (Net-Centric)

- Joint IP Dynamic Routing
- IP Addressable
- X Decommissioned
- RED TEXT = Added Platform

Joint Engagement Forums

U.S. AIR FORCE

Senior Level

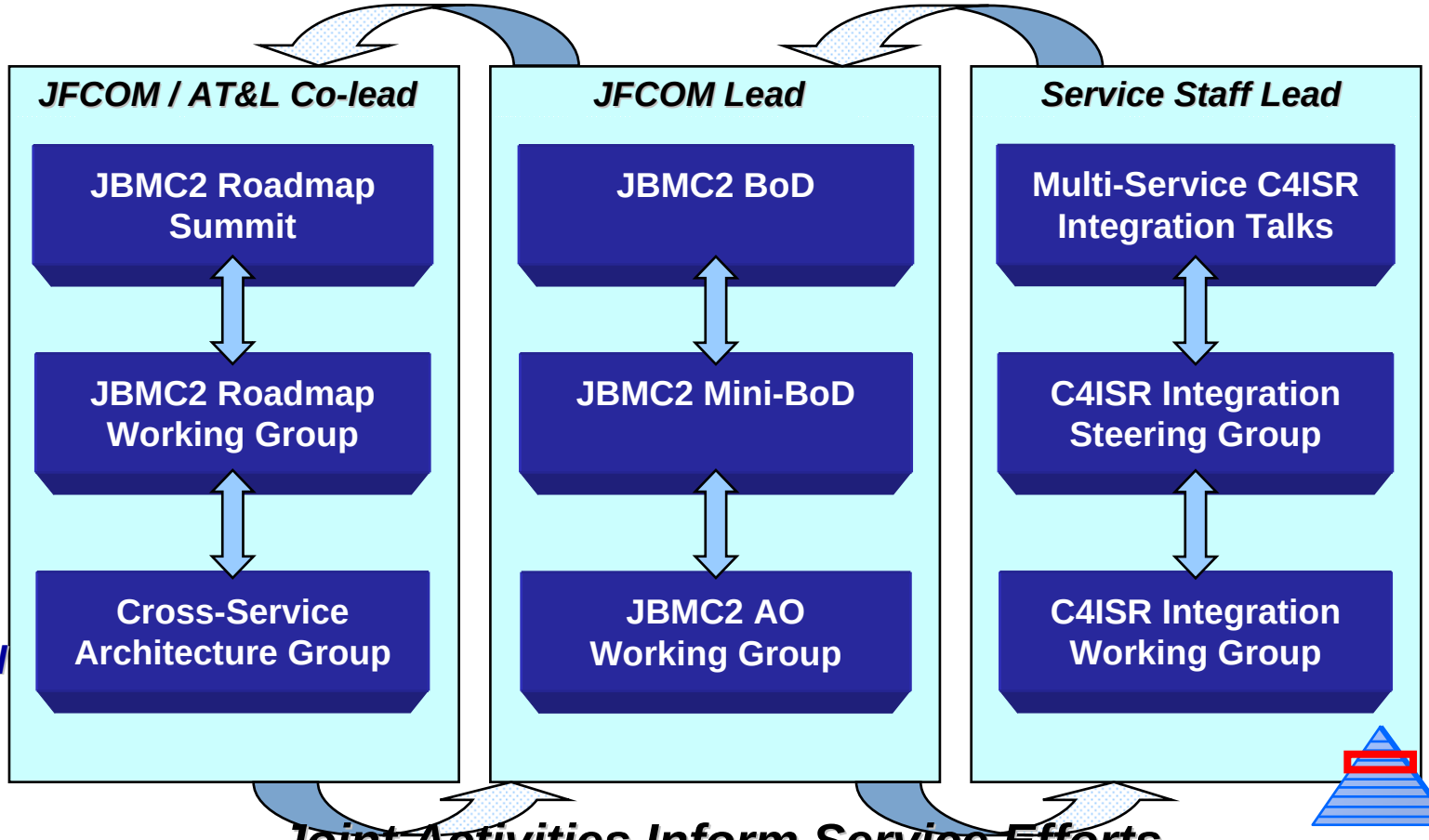
Continuous Service-to-Service Warfighter Talks

CONOPs Driven into the Tank & Joint World

Policy Level

Working Level

Technical Level



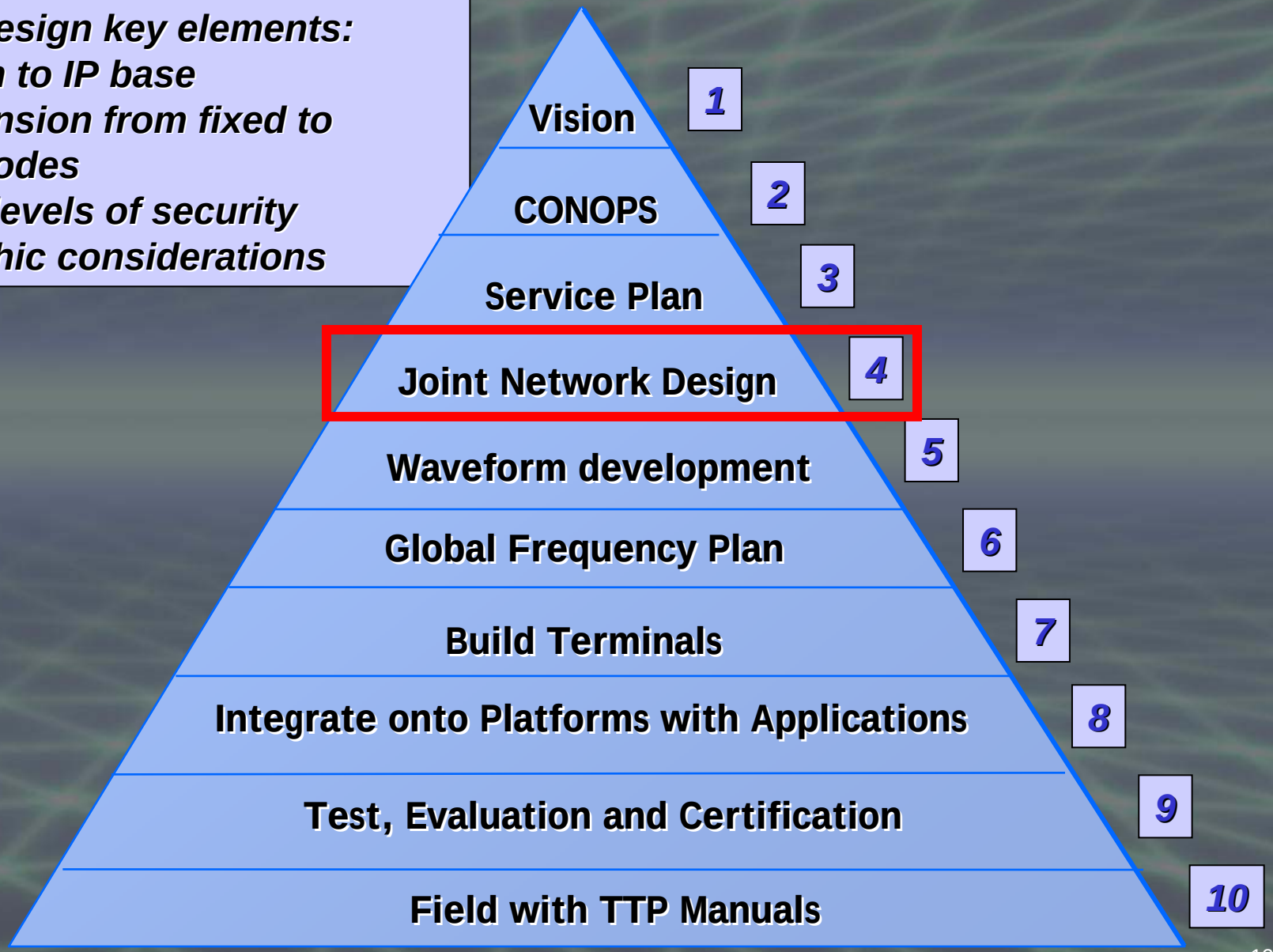
Joint Activities Inform Service Efforts

AFC2ISR CENTER — JFCOM COLLABORATION

Elements to Develop Joint NCW Capability

Network Design key elements:

- ***Migration to IP base***
- ***GIG extension from fixed to mobile nodes***
- ***Multiple levels of security***
- ***Geographic considerations***

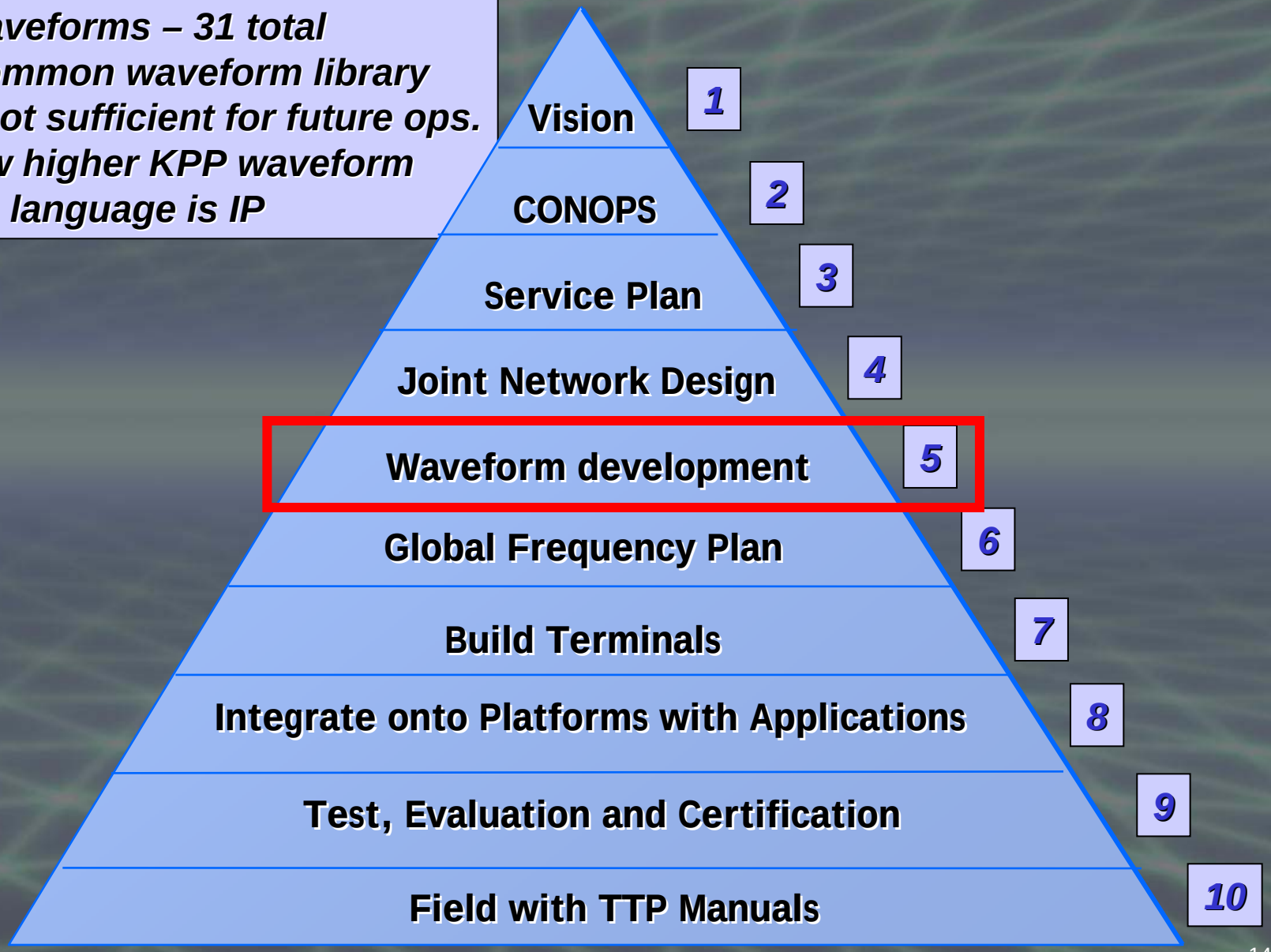


Long Term Plan

IP based Considerations for Joint Machine to Machine Network

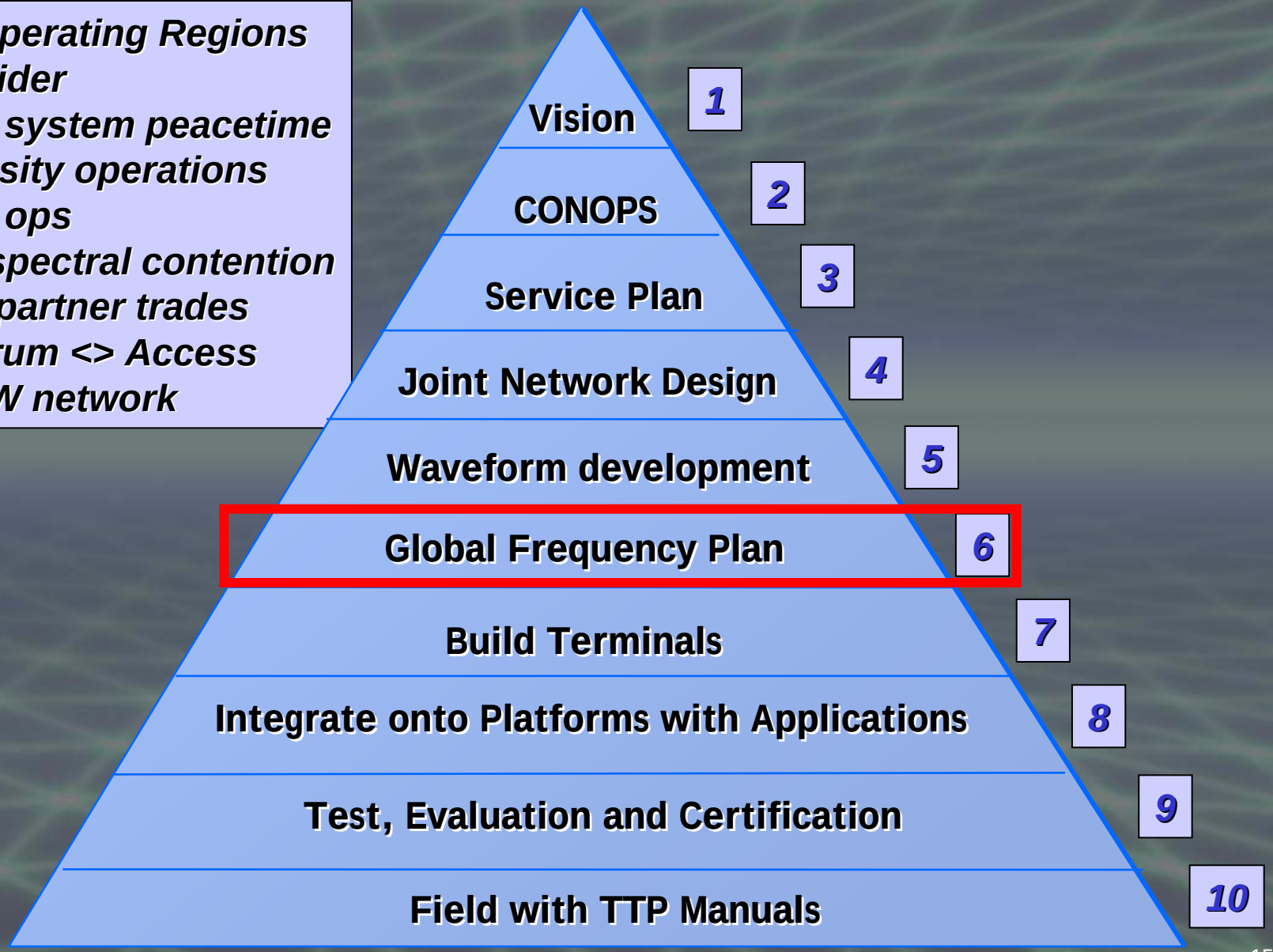
Elements to Develop Joint NCW Capability

Legacy waveforms – 31 total
JTRS – Common waveform library
- Legacy not sufficient for future ops.
- Need new higher KPP waveform
- Common language is IP



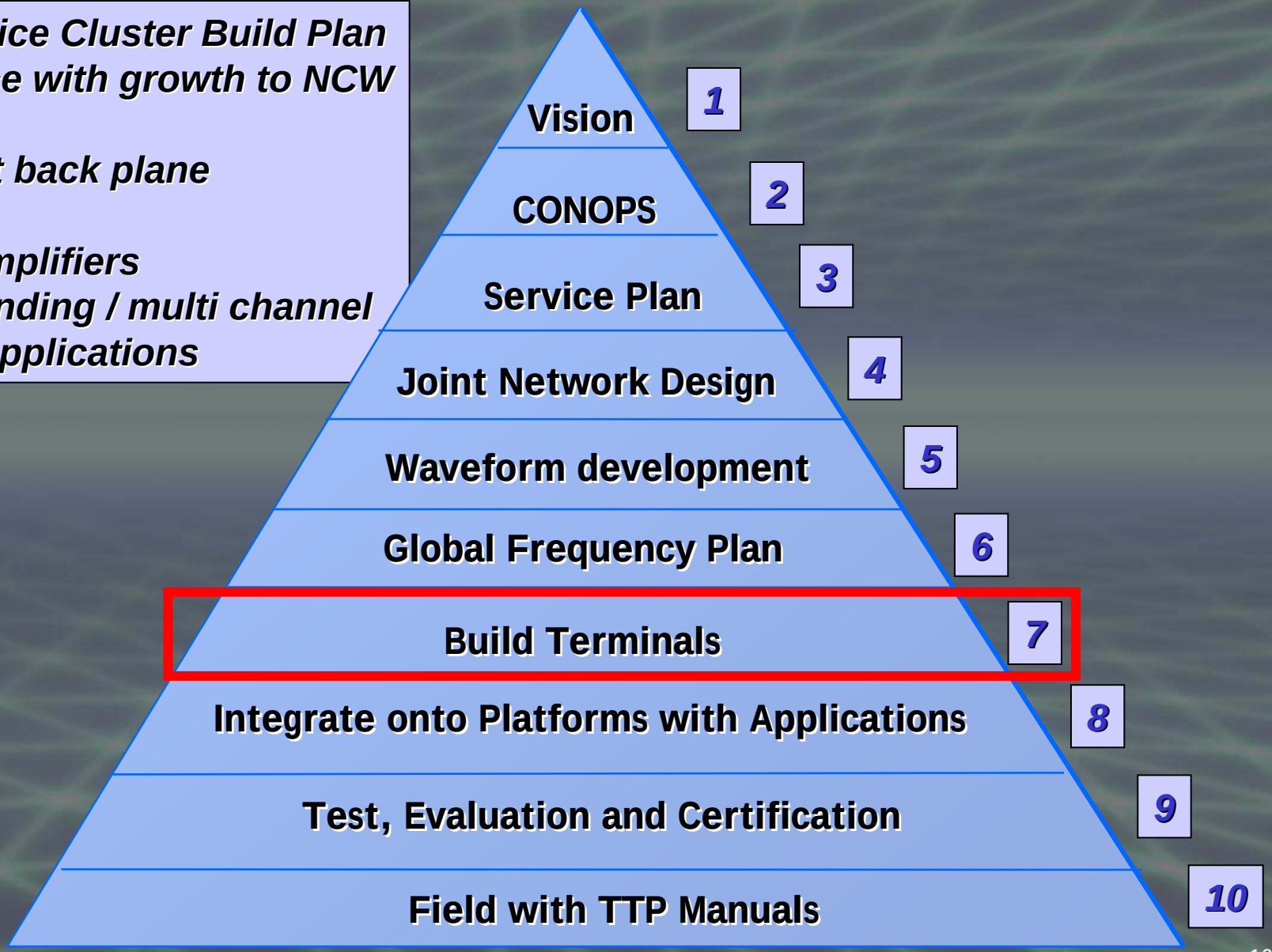
Elements to Develop Joint NCW Capability

3 Global Operating Regions
Must consider
-Using the system peacetime
-Low intensity operations
-Full scale ops
-Growing spectral contention
-Coalition partner trades
Spectrum <> Access to NCW network



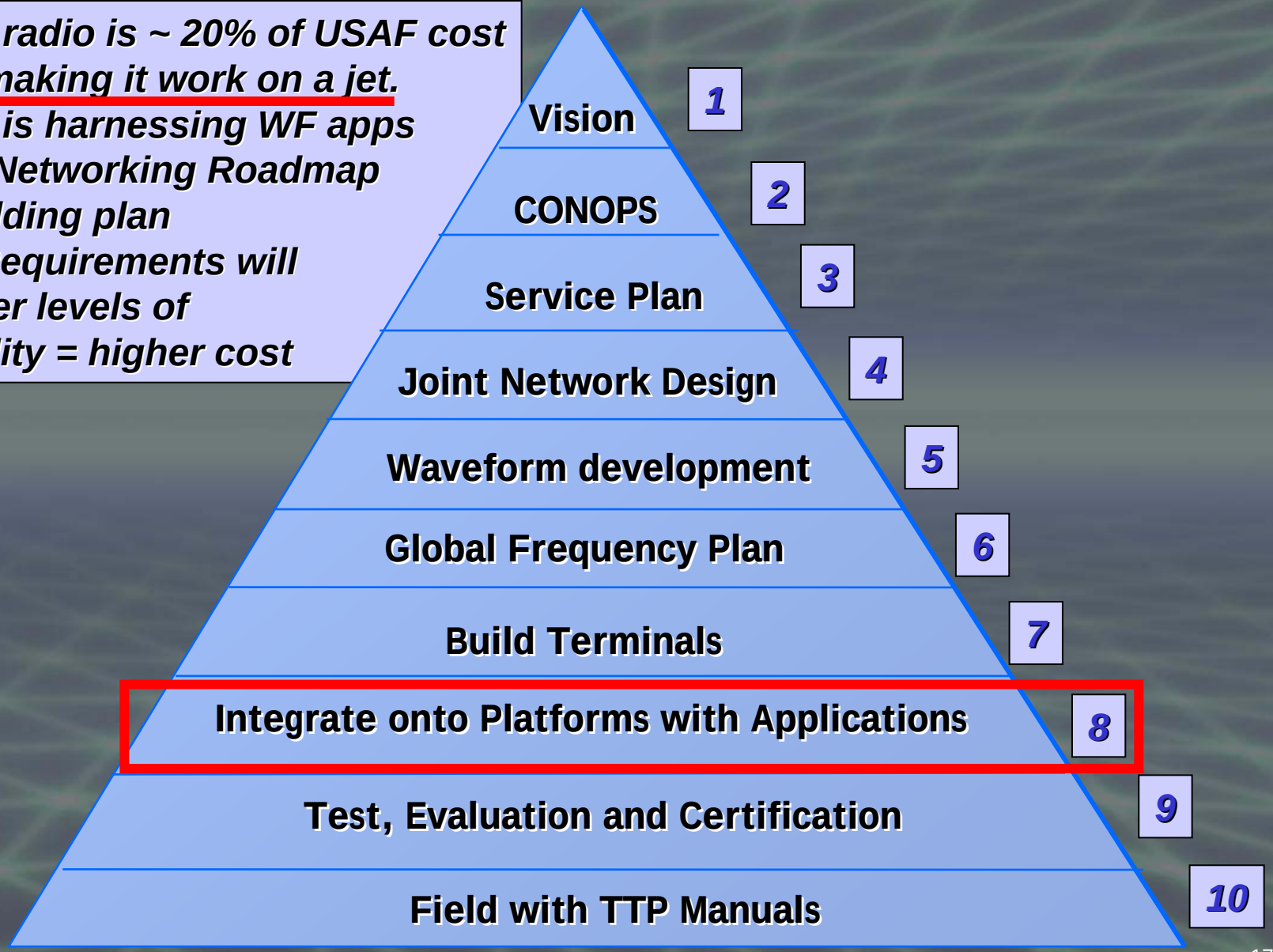
Elements to Develop Joint NCW Capability

JTRS Service Cluster Build Plan Compliance with growth to NCW
Key parts:
- Sufficient back plane
- Crypto
- Power Amplifiers
- Cross banding / multi channel
- In radio applications



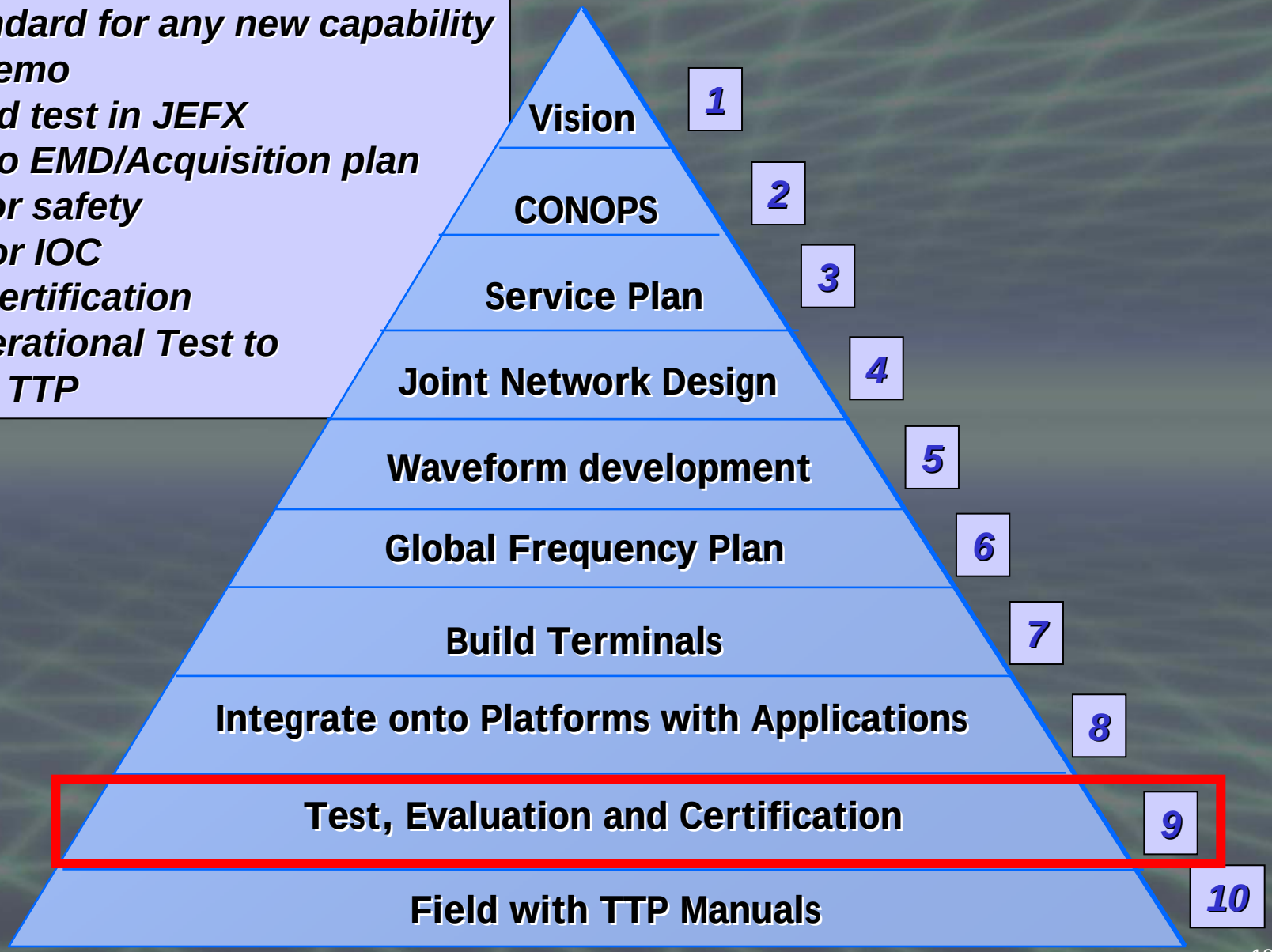
Elements to Develop Joint NCW Capability

Building a radio is ~ 20% of USAF cost
~ 80% is making it work on a jet.
-End state is harnessing WF apps
-Airborne Networking Roadmap
-5 level fielding plan
-Mission Requirements will drive higher levels of Functionality = higher cost



Elements to Develop Joint NCW Capability

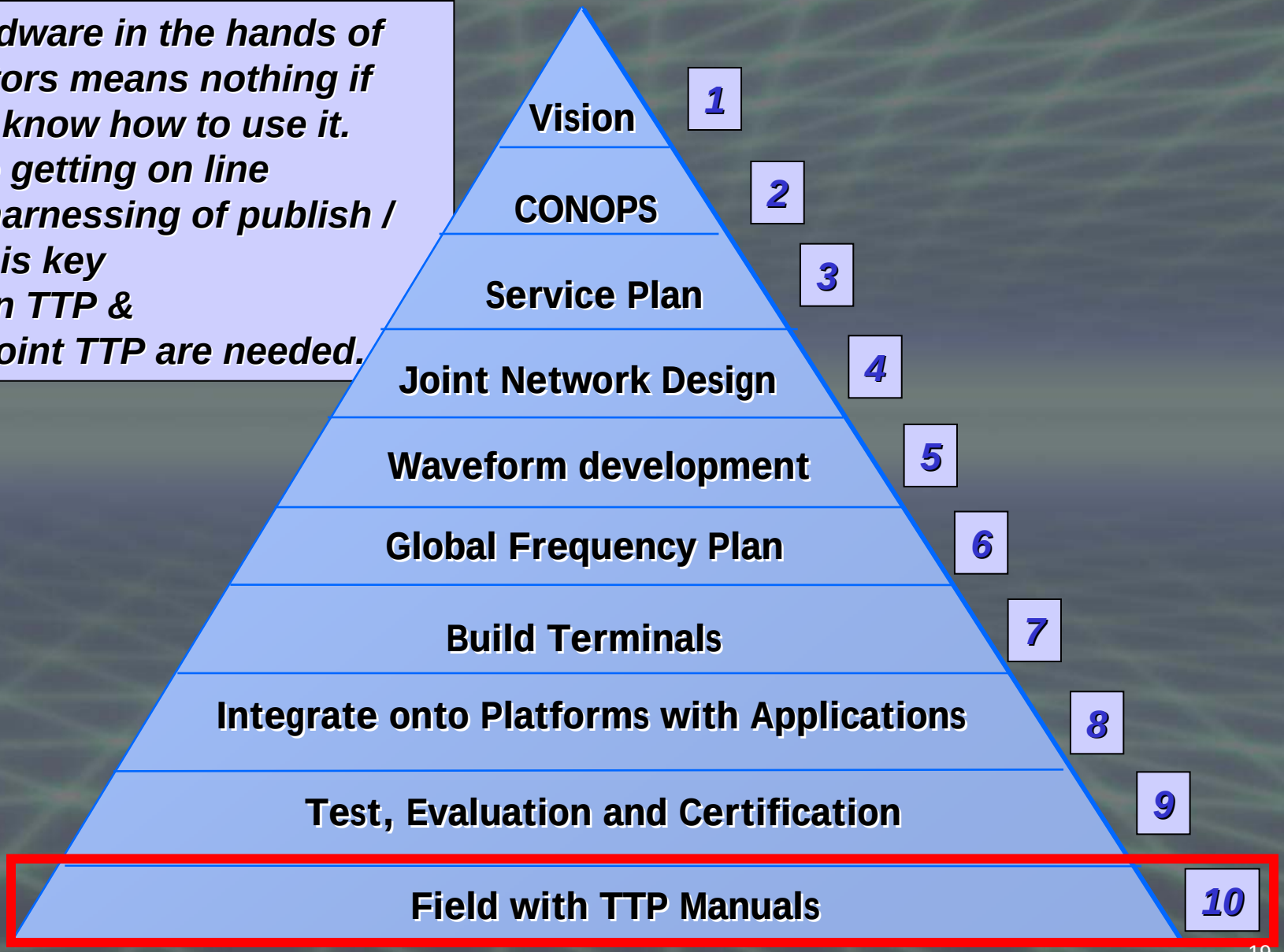
USAF Standard for any new capability
- *Build a demo*
- *Initial field test in JEFX*
- *Commit to EMD/Acquisition plan*
- *DT test for safety*
- *OT test for IOC*
- *Parallel certification*
- *Joint Operational Test to yield Joint TTP*



Elements to Develop Joint NCW Capability

Getting hardware in the hands of the Operators means nothing if they don't know how to use it.

- *Basics are getting on line*
- *Advance harnessing of publish / subscribe is key*
- *Changes in TTP & Codified Joint TTP are needed.*



In Summary

Air Force is fully committed to co-developing integrated capabilities delivering Joint effects by significant investment in time, resources, and people to advance Joint Net-Centric Capability

JBMC2

Sum of all Wisdom: Placing the Cursor over the Target, the Operator Doesn't Care Where the Info Came From

Transforming the NATO Alliance:

NATO Network Enabled Capability Initiatives

Mr. J. Troy Turner

Section Head, Interoperability Standardization & Architectures

HQ SACT, C4I Division

Aim of Presentation

- Describe NATO's beginnings in the area of Net-Centric thinking
- Outline recent initiatives
- Address bottom-up data/info collaboration
- Address top-down Guidance for NATO
- Inform of future plans - including engagement with Industry

The Threat of Global Terror

e Washington Post

HOME EDITION

FRIDAY, MARCH 12, 2004

NEWSSTAND 35¢

Madrid Train Blasts Kill at Least 190

10 Bombs Detonate Almost at Once; Nearly 1,500 Hurt

By KEITH B. RICHBURG
Washington Post Foreign Service

MADRID, March 11—Ten nearly simultaneous explosions tore through four packed commuter trains in Madrid during rush hour Thursday morning, killing at least 190 people and wounding nearly 1,500 in the worst terrorist attack in modern Spanish history, three days before national elections.

The explosives were placed in backpacks and left aboard trains and on tracks at three stations. Witnesses describing the scenes of chaos and carnage said they heard multiple explosions at the city's busy Atocha station, which sent passengers scrambling in a panic. A makeshift emergency hospital was set up alongside the tracks at the station, just south of the Prado Museum. Buses were hurriedly converted into ambulances. The walking wounded were asked to make it to hospitals on their own, and leave vehicles available for the more severely injured.

Prime Minister Jose Maria Aznar called the attacks "a mass mur-

Victims of the bombings, which took place during the morning rush hour, sit scattered among rescue workers outside Madrid's Atocha station.

A Catastrophe 'Like the Twin Towers'

riage licenses to same-sex couples after lawsuits by the state and conservative groups. It ordered hearings within three months to decide the legality of the unions.

But the high court did not void the more than 4,161 marriage licenses that San Francisco has issued to same-sex couples since Feb. 12, as the California attorney general had requested. Rather, in its unanimous ruling, the seven-member panel said it would let those on both sides of the issue argue their case as early as May.

The Supreme Court decision stops, at least for now, the wave of same-sex marriages here that inspired local leaders in other states, including New Mexico and New Jersey, to officiate at gay weddings. Gay couples from around the nation have flocked to San Francisco to be married in re-

Iraq Conflict Initial Observations

Top 20 Observations

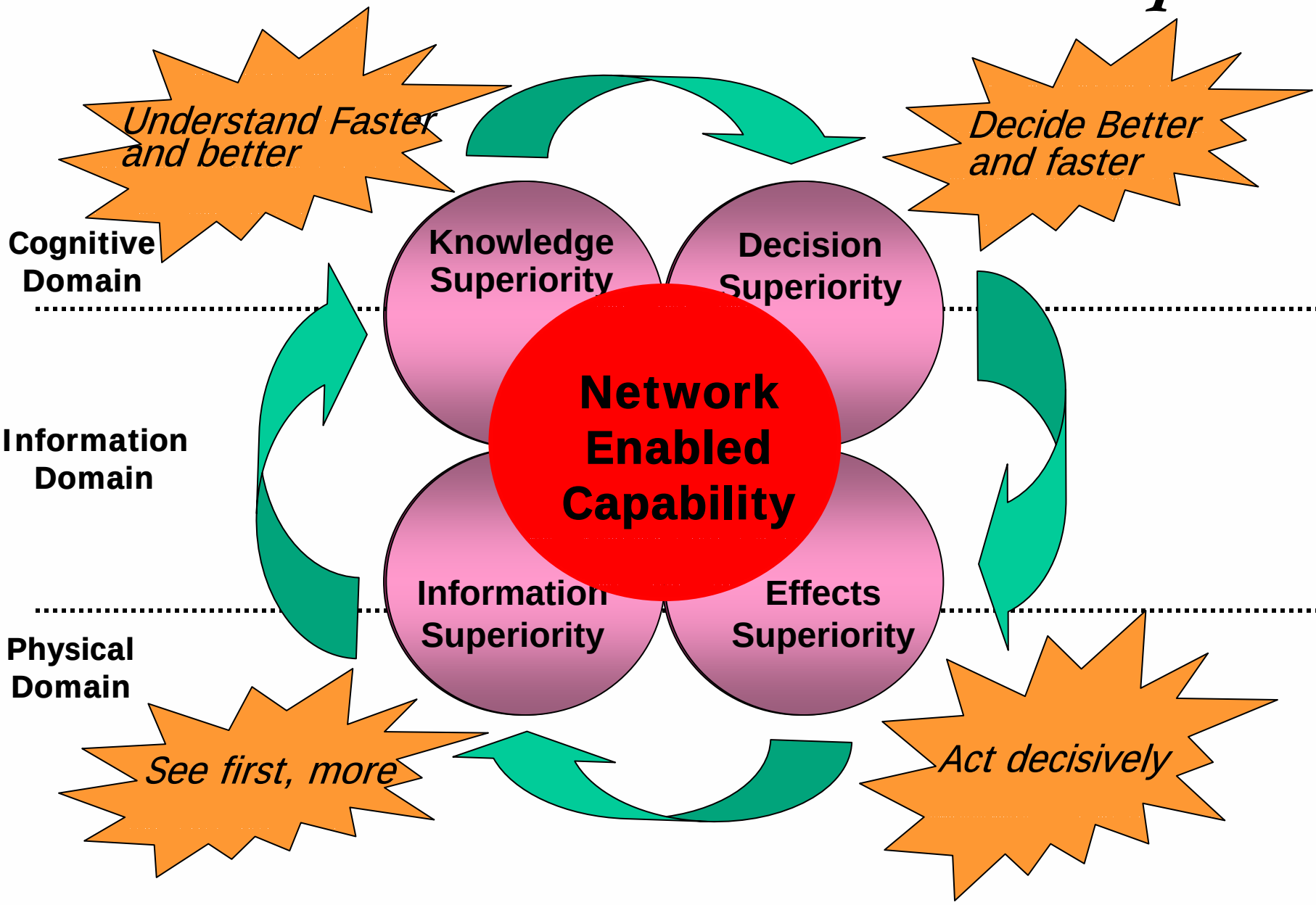
- NATO decision making process is not responsive enough
- Rapid deployment and effects achievement are keys in capabilities
- Knowledge enabled warfare
- Network Centric Warfare
- Deployable HQ C2 and CIS

"The NRF must be rapidly deployable, Network-Centric, able to quickly achieve effects, with capable command and control, intelligence, surveillance and reconnaissance systems that operate collaboratively while providing a common operation picture."

General H. Kujat

Iraq Conflict Initial Observations Seminar July 2003

NNEC and the Decision Loop



Key Milestones

- NNEC IPT Formation - Nov 03
- First NATO Network Enabled Capability Conference - Mar 04
- Engaged NATO Military Committee - Apr 04 and Jan 05

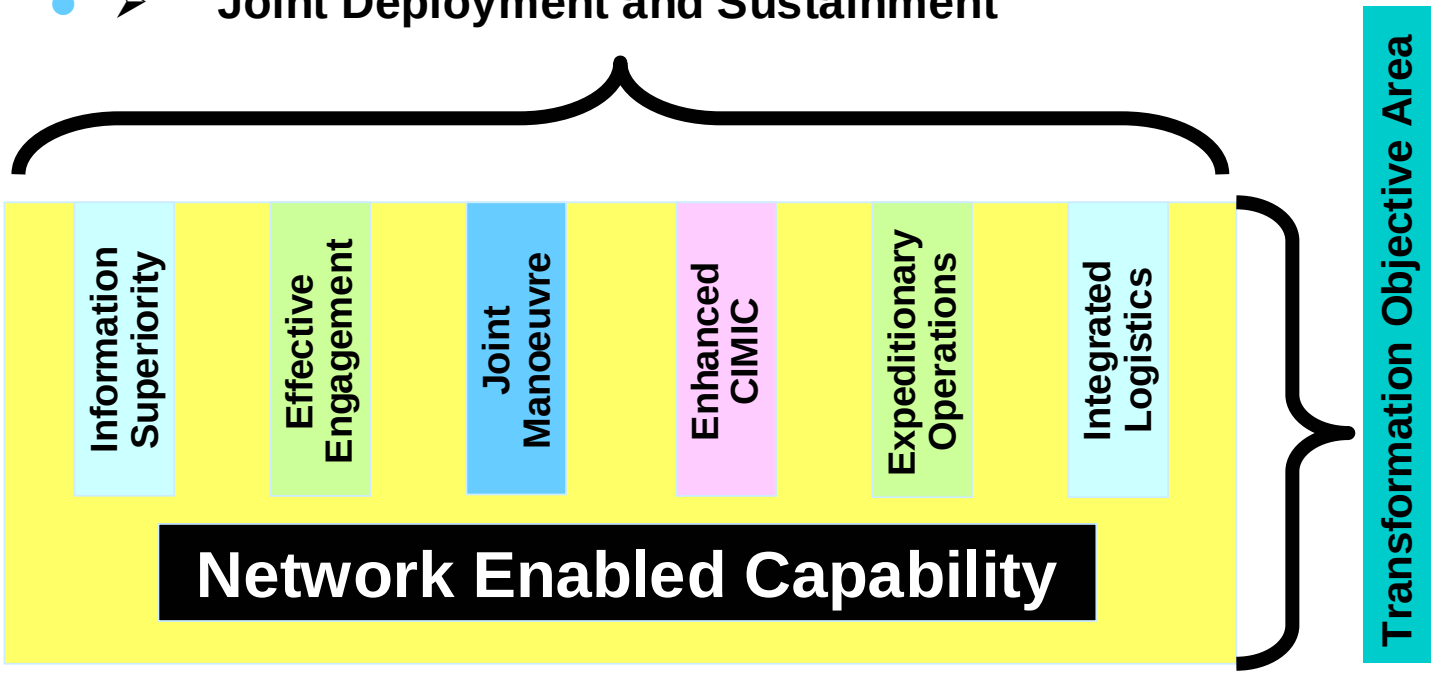
NNEC Foundation Document

- To establish a common understanding of the scope, benefits and implications of NEC for NATO.
- To provide an interim view of the “vision and concept” for NNEC.
- To identify a roadmap for delivery of NNEC

ACT's Strategic Vision

Transformational Goals and Objectives

- **<u>Effects-based operations</u>** require:
- ➢ **Decision Superiority**,
- ➢ **Coherent Effects**
- ➢ **Joint Deployment and Sustainment**



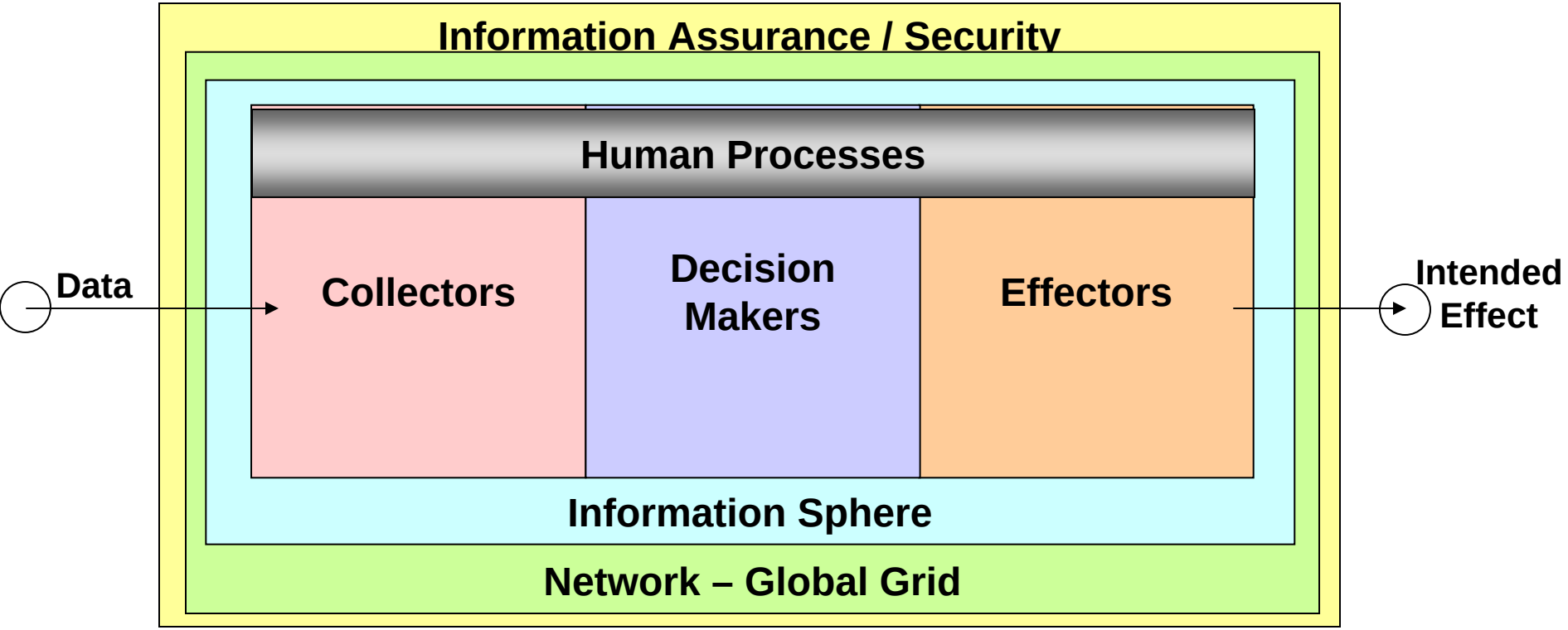
NATO Network Enabled Capability (NNEC) - Defined

- NNEC encompasses the elements involved in linking collectors, effectors and decision makers together, to enable the development of a NATO, Network-Centric, Effects-Based, Operational Capability.
- This will involve the Joint Deployment and Sustainment of forces that are able to translate superior information into increased combat power and mission effectiveness through Decision Superiority, leading to rapid, flexible, precise, coherent operational effects.

Conceptual Framework

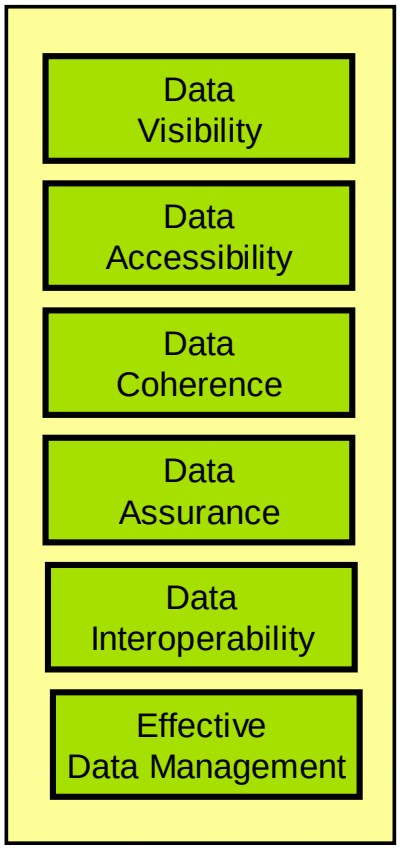
Goals:

- **Information Superiority**
- **Decision Superiority**
- **Execution Superiority** →
  - •Coherent Effect
  - •Joint Deployment and Sustainment



NNEC Data Strategy Goals

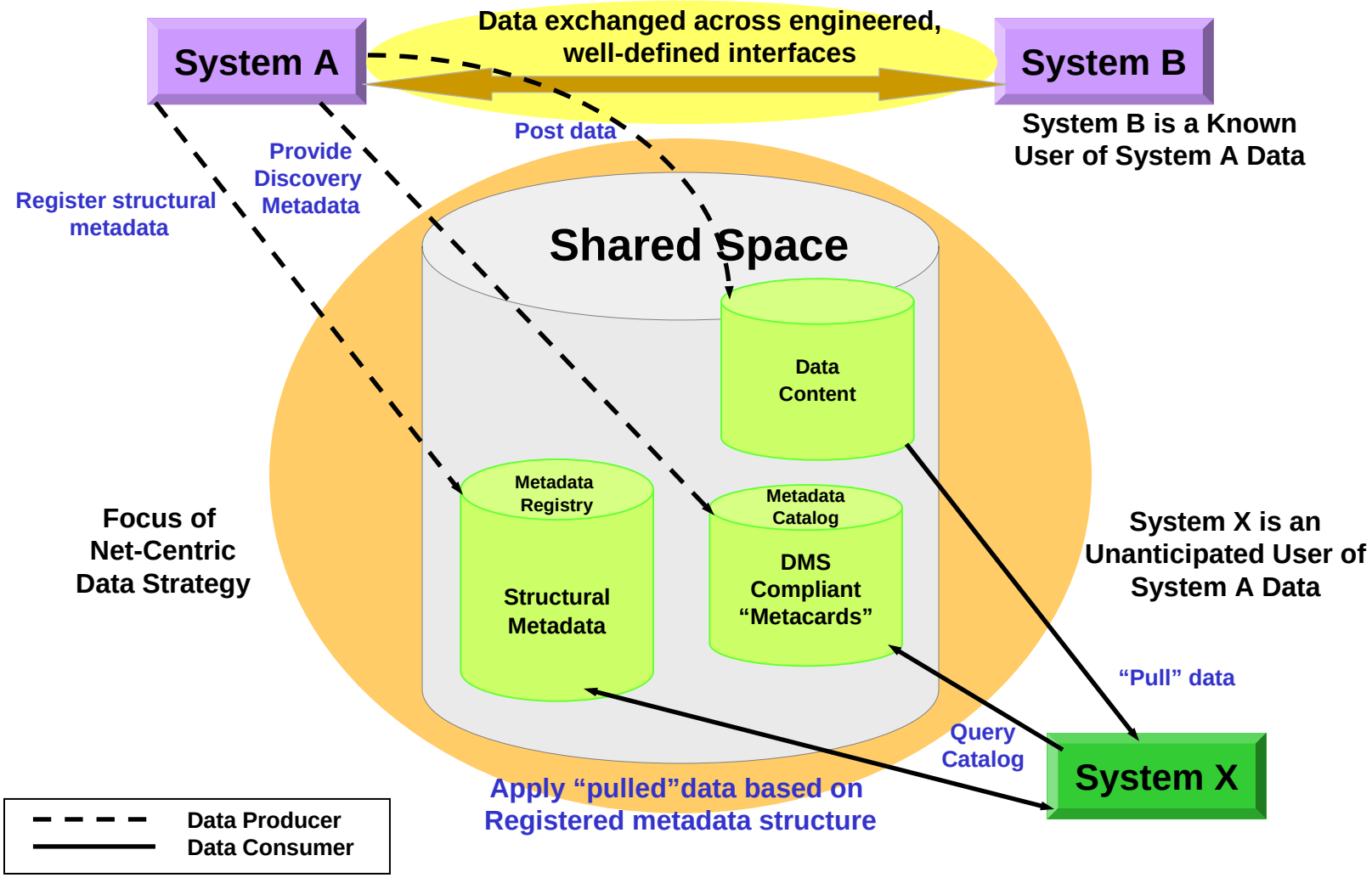
Key Goals



Key Actions:

- ✓ **Make Data Assets Available to the Enterprise:**
  - Use metadata to describe and advertise data assets (e.g., documents, web pages, images, etc)
  - Create data asset catalogs and organize by community-defined structure (ontology)
  - Make Data Assets available to “shared space” where Enterprise users can access it
- ✓ **Make System Data and Process Available to the Enterprise:**
  - Define and register the format and semantics of system data and processes
  - Provide reusable/easy-to-call access services to make system data and processes available to the Enterprise

NNEC Data Environment



Information Domain

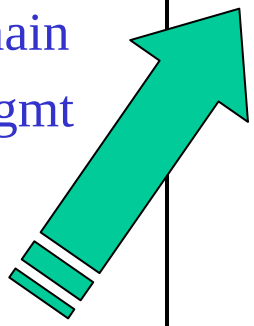
"Bottom up Collaboration – an example"

IS-NNEC IPT

- Product Responsibility
  - Information Domain
  - Information Resource Management
  - Data Strategy
    - Metadata Specification
    - COI Metadata Development
  - Info/Knowledge Management (IKM)

IS-NNEC

- Product Responsibility
  - Information Domain
  - Info Resource Mgmt
  - Data Strategy
  - IKM
  - **Infosphere projects**



NC3A SPOW-05

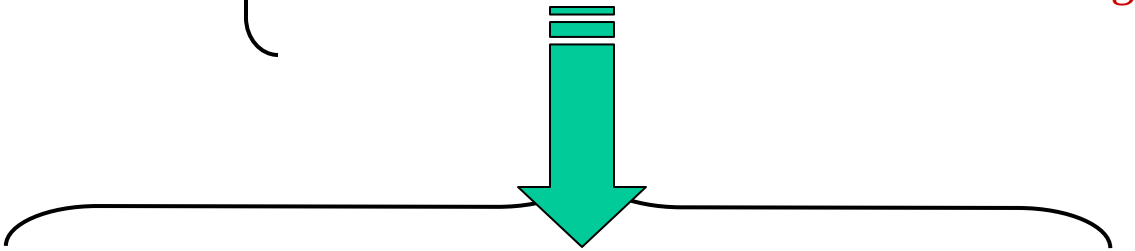
- Infosphere (FWA-3)
  - C4ISR Sources/Services IO
  - IKM for JOCS (Ops)
  - Value-Added Services (XML)
  - TDL-XML Tactical Data Exchange

IS-NNEC

- Product Responsibility
  - IM/KM Strategy
  - Data Strategy
  - Infosphere projects

NC3A SPOW-05

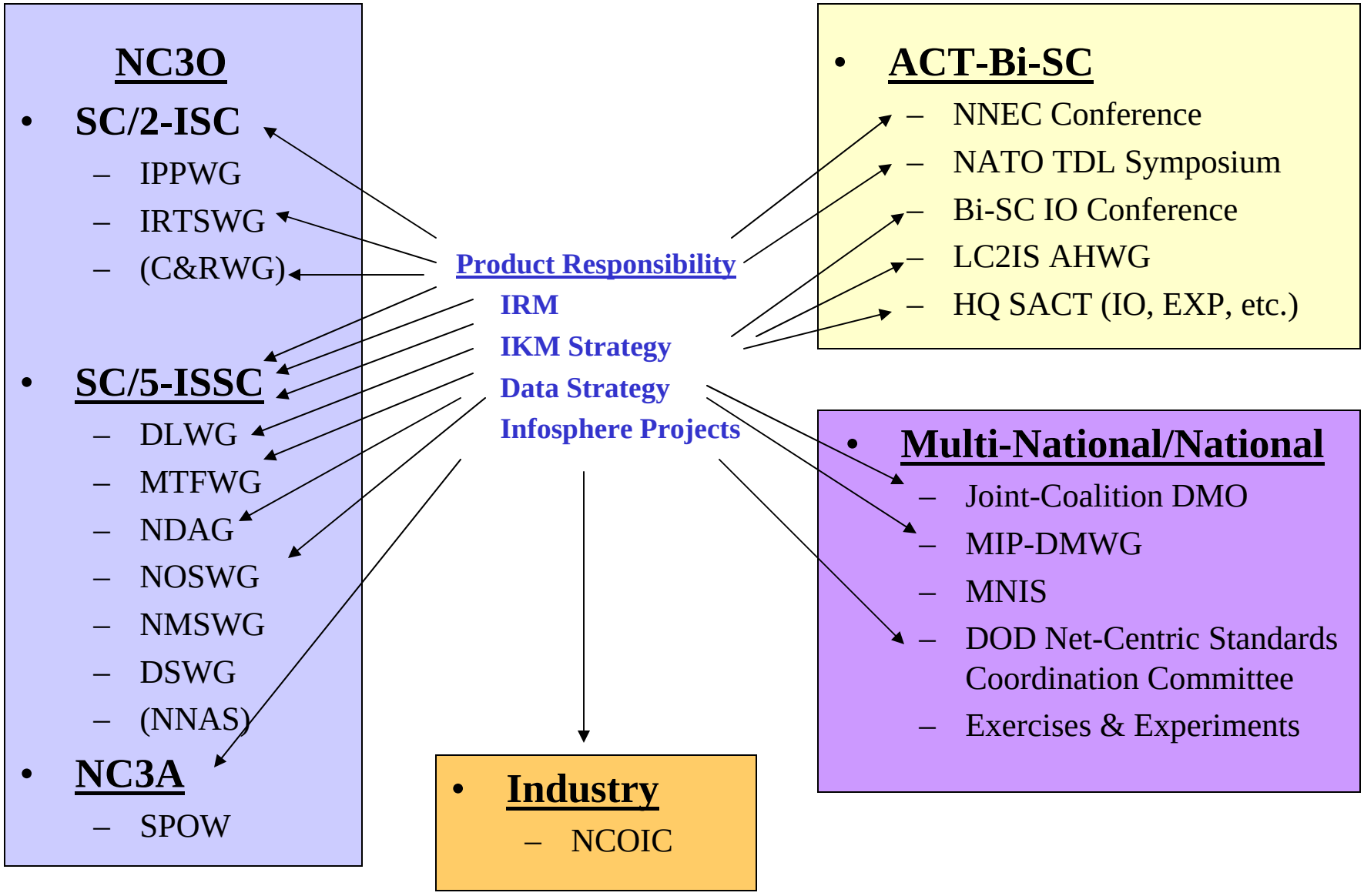
- Infosphere (FWA-3)
  - C4ISR Sources/Services Interop.
  - IKM for JOCS (Ops)
  - Value-Added Services (XML)
  - TDL-XML Tactical Data Exchange



EPOW-06

- Deployable Capability for TDL Interface & Network Mgmt
- Operational TDL Analysis Toolset
- Info Systems Interoperability Trials
- Real-Time Data Exchange

NNEC IPT Coordination (1 aspect)



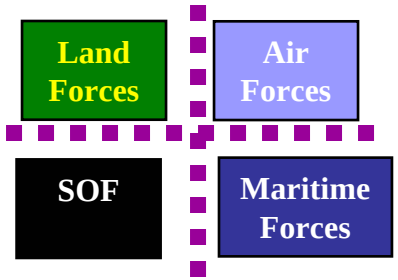
Attributes of a Transforming NATO Force

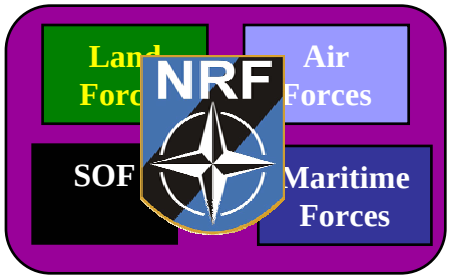
Deconflict Services & Cultures

Stitch National Seams

Integration of *NRF* Capabilities

Effects-Based, Collaborative, Network Centric and Interdependent





Deconflicting

Coordinating

Integrating

Coherence

The NNEC Strategic Framework

- NNEC Vision and Concept for NNEC
- The Business Case for NNEC
- Operational and System Architectures
- Capability Packages and Force Proposals Review
- Roadmap for NNEC realization
- A detailed plan for the next phase of NNEC

2nd NNEC Conference

- 5 - 7 Apr 05 + pre-conference day on 4 Apr
- Sheraton Norfolk Waterside
- 350+ expected attendees
  - User and technology expertise
    - OF-4/6 level
    - People / Information / Network “knowledgeable representatives”
  - NATO Nations (“at 26”) invited plus PfP Nations
  - All NATO entities with an interest in IS & NNEC
  - Industry
  - Other invited nations

Conference Aims

- To lay the foundations for NNEC Implementation
  - To improve the understanding of requirements
  - To discuss the overall framework for NNEC delivery
  - To develop the community of interest
  - To improve the understanding of the role of Industry
  - To support the NNEC Feasibility Study and IPT
- To educate
- To develop momentum on NNEC development

Network Centric Operations Industrial Consortium (NCOIC)

- IS-NNEC IPT engagement with NCOIC
- Industry Day - Berlin
- ACOS C4I (IPT Director) member of NCOIC Advisory Council
- NCOIC Formal Launch 28 Sep 04

Moving Forward

- 1st Advisory Council Meeting 10 Nov 04 – Washington DC
- Areas of engagement being developed
- Touch points – Advisory, Business and Technical Councils

NCOIC 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.

- Primary tenets of the Consortium's vision:
  - Work to identify and develop a Network Centric environment
  - Enable assured technical interoperability
  - Embrace, enhance, and encourage open standards
  - Establish and educate on common principles and processes

Members of NCOIC

BAE Systems
Boeing
CACI
CBT
Cisco
EADS
EMC²
Ericsson
Factiva
Finmeccanica
General Dynamics
Hewlett-Packard
Honeywell
IBM
Israel Aircraft Industries, Ltd.
PTC
Wakelight Technologies, Inc.
Innerwall
L3C
Lockheed Martin
Microsoft
Northrop Grumman
Oracle
Raytheon
Rockwell Collins
SAAB
SAIC
Smiths Aerospace
Sun Microsystems
Thales
Themis
Bay Microsystems, Inc.
Sikorsky Aircraft

Total - 33 as of Nov 04

NNEC Benefits

- Support to Expeditionary Operations
- Higher Operational Tempo
- Reach Back
- Specialist Capabilities
- Economies of Scale
- Agile Command and Force Structures
- Force Multiplier

NATO Network Enabled Capability
ACT's Strategy for Change

Focus on
NRF

Incremental
Approach

Education
&
Marketing

Agree on a
Achievable
Vision

Target areas
offering
early success

Experimentation
to de-risk

Seek
Economies
of scale

Questions?

Transforming the NATO Alliance:

NATO Network Enabled Capability Initiatives

Mr. J. Troy Turner

Section Head, Interoperability Standardization & Architectures

HQ SACT, C4I Division

Joint Battle Management Command and Control (JBMC2) in a Net Centric Environment Panel

Net Centric Operations, Interoperability & Systems Integration Conference
24 Mar 05

Alex Urrutia
USJFCOM, J8
JI&I/JBMC2

Panel Purpose

- Provide information and stimulate discussion on Net Centric Operations in a Joint Battle Management Command and Control (JBMC2) Environment
  - JBMC2 Net Centric Initiatives
  - JBMC2 Net Centric Operations

What the Warfighter Needs

- An integrated, interoperable, and networked joint force that will have:
  - Common shared situational awareness
  - Fused, precise and actionable intelligence
  - Coherent distributed and dispersed operations
  - Decision superiority
- Resulting in more agile, more lethal, and more survivable joint operations

An Interoperable and Networked Joint Force Facilitates Implementing:

- Emerging Joint Warfighting Concepts:
  - Standing Joint Force Headquarters
  - Collaborative Information Environments
  - Operational Net Assessment
  - Effects Based Operations
  - Joint Interagency Coordination Group

JBMC2 Requirements Panel Agenda

- 0800-0815 ***Introduction***
  Mr. Alex Urrutia/USJFCOM-J8/JBMC2 Moderator

JBMC2 NET CENTRIC INITIATIVES & OPERATIONS:

- 0815-0835 ***Joint Community of Interest (COI) Data Implementation***
  Capt Michael Salvato/USJFCOM-J6
- 0835-0855 ***Time-Sensitive-Targeting (TST) Community of Interest***
  Mr. Jon Park (Northrop Grumman)/USAF Langley
- Multi National Information Sharing (MNIS) – Canceled
- 0855-0920 ***Allied Command Transformation (ACT) Net Cent Initiatives***
  Mr. Troy Turner/ACT
- 0920-0945 ***Joint Deployment Process Owner (JDPO) Operations in a Net Centric Environment***
  COL Edward Hatch /USJFCOM-J9
- 0945-1000 ***Break***

JBMC2 Requirements Panel Agenda

JBMC2 NET CENTRIC INITIATIVS & OPERATIONS (Contd):

- 1000-1020 ***Joint Urban Ops (JUO) in a Net Centric Environment***
  Mr. Fred Stein (MITRE)/USJFCOM-J9
- 1020-1040 ***Joint C2 Operations in a Net Centric Environment***
  Mr. John Wellman/USJFCOM-J8
- 1040-1100 ***Joint Experimentation Net Centric Initiatives w CENTCOM***
  Maj Edward McLarney/USJFCOM-J9
- 1100-1145 ***Panel discussion***
  Mr. Alex Urrutia/USJFCOM-J8/JBMC2

BRIEFERS BACKGROUND

Mr.Alex Urrutia: Director JBMC2; USJFCOM J8 Directorate

CAPT Michael Salvato: Chief, Net Centric Communications, Capabilities. and Integration Division; USJFCOM J6 Directorate

Mr. Ron Park: Northrop Gruman Contractor supporting the USAF C2 & ISR Center (AFC2ISR) Langley, Virginia

Mr. Troy Turner: Section Head, C4I Standardization & Architectures; Supreme Allied Command Transformation

COL Edward Hatch: Director Joint Deployment Process Owner; USJFCOM J9 Directorate

Mr. Fred Stein: MITRE Contractor, Lead General Systems Engineer, C4ISR Systems Technology supporting USJFCOM J9 Directorate

Mr. John Wellman: Director, Joint Force Integration Division; USJFCOM J8 Directorate

Maj Edward McLarney: USJFCOM J9 Joint Experimentation Directorate prototype Task Engreering Lead

NOTE: Contractors performing work for USJFCOM are not employees of USJFCOM and can not make official comments on behalf of JFCOM or DoD, but are considered to be Technical and Subject Matter experts on the projects they are supporting.

Summary

- Net Centric JBMC2 Capability interoperability and integration are fundamental to effective joint operations
- Net Centricity requires paradigms in the way we do business

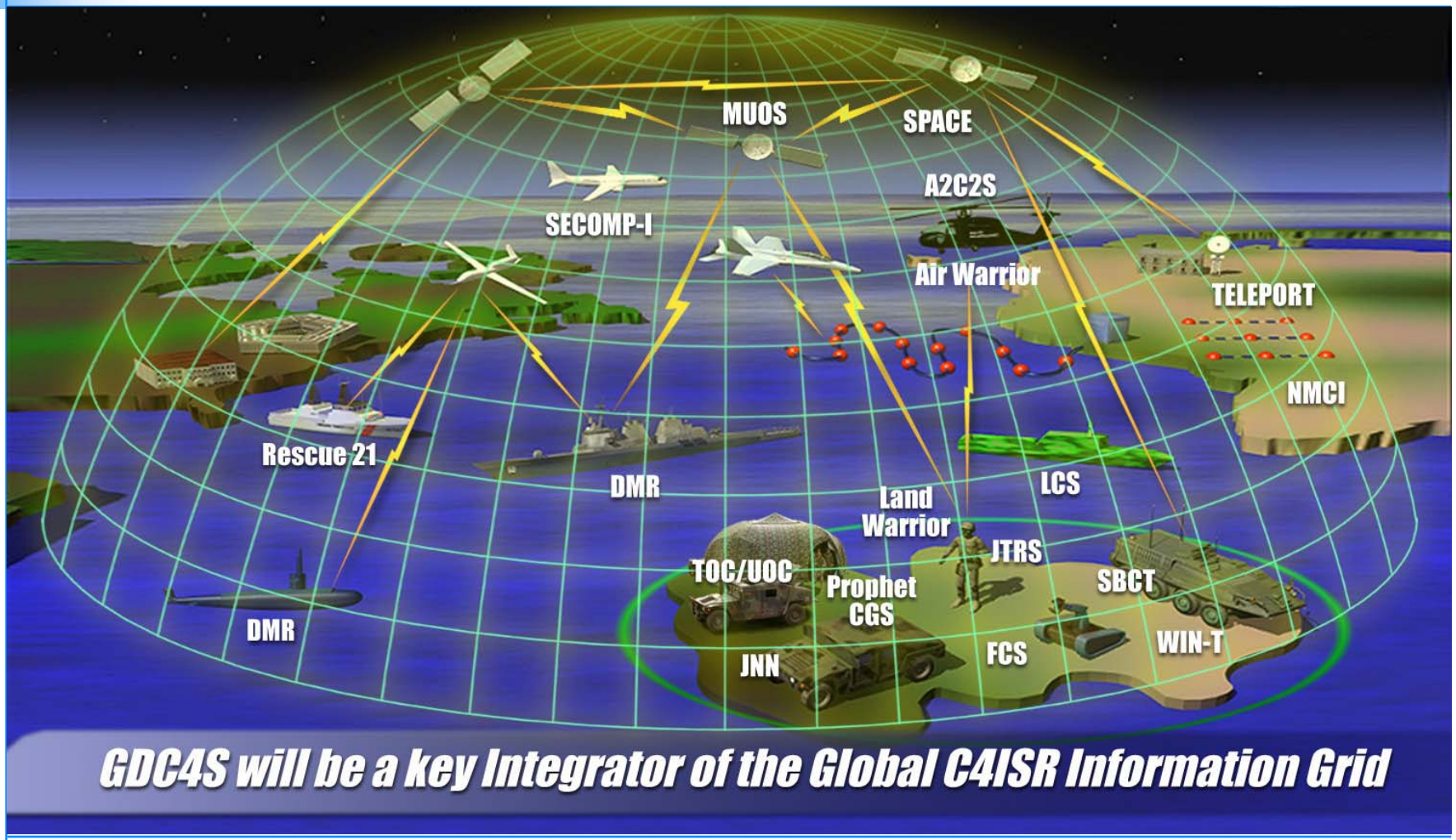
Panel Member Presentations

GENERAL DYNAMICS
C4 Systems

Analysis and approach for Army Interoperability

Patrick A. Vessels
Director, Strategic Technologies
General Dynamics C4 Systems
Battle Management Systems Division

Seamless C4ISR - Core to Edge



Communications and Networking

Information Assurance

Command and Control

Intelligence, Surveillance, Reconnaissance (ISR)

Space Systems and Services

GENERAL DYNAMICS
C4 Systems

Ruggedized Computing and Displays

Platform Integration

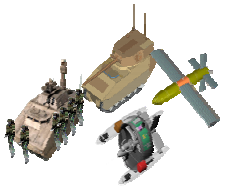
Ground-Based Satellite and Wireless Communication Products

RF Networking

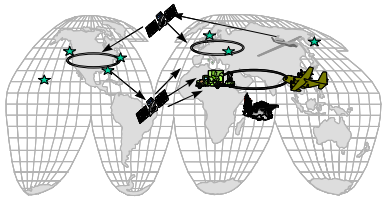
Homeland Security

Key Architectures in the Army

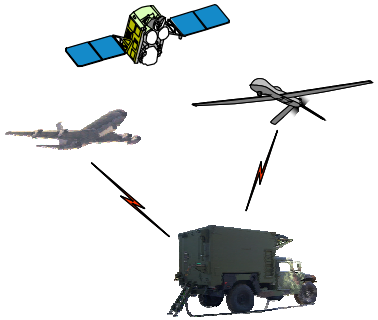
- System of Systems Common Operating Environment (SoSCOE)
- Army Battle Command Systems 6.4
- Distributed Common Ground System – Army
- Network Centric Enterprise Services
- Land Warrior/Future Force Warrior



FCS/SoSCOE



NCES/JC2

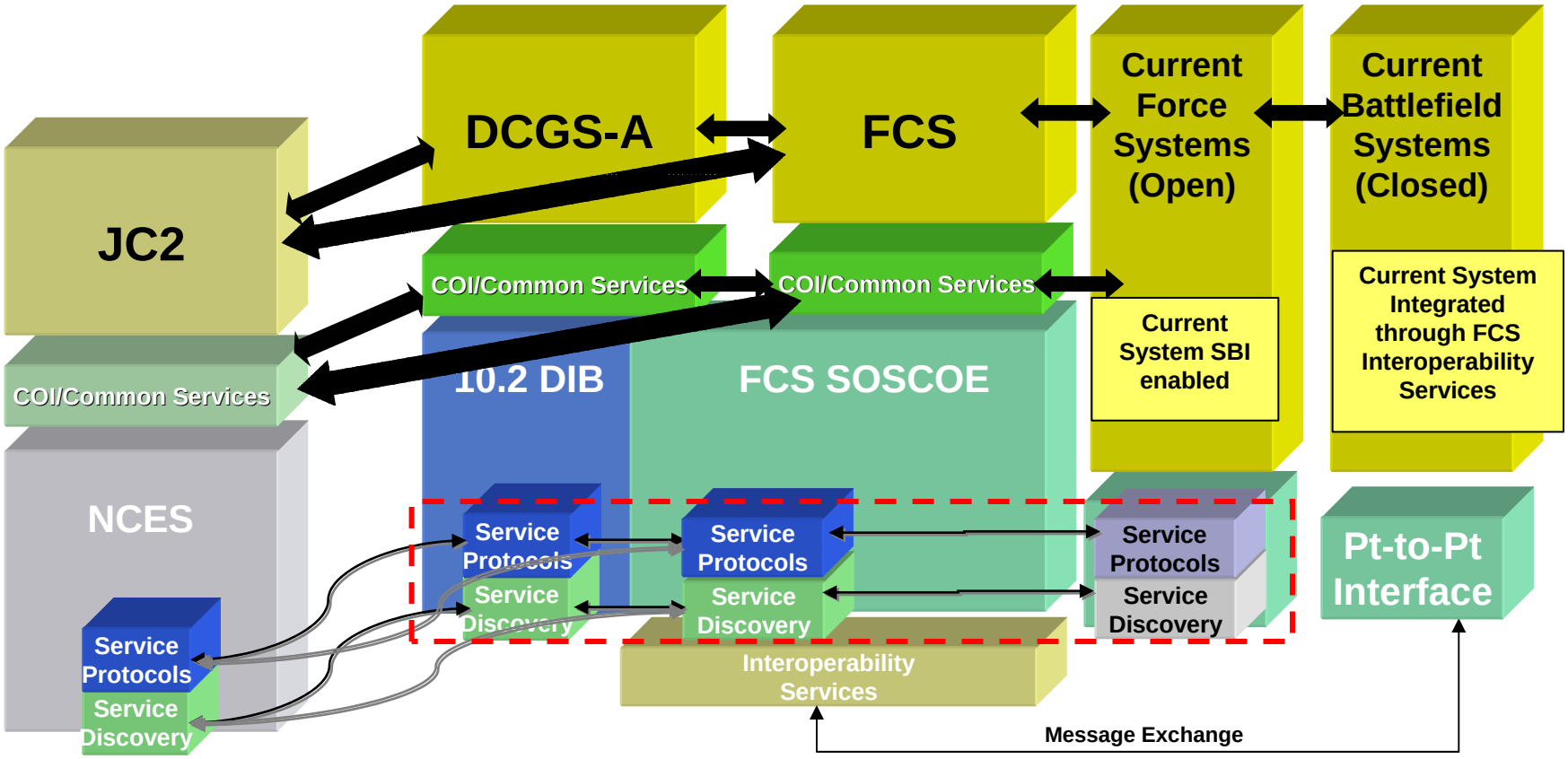


DCGS-Army

Land Warrior/
Future Force Warrior

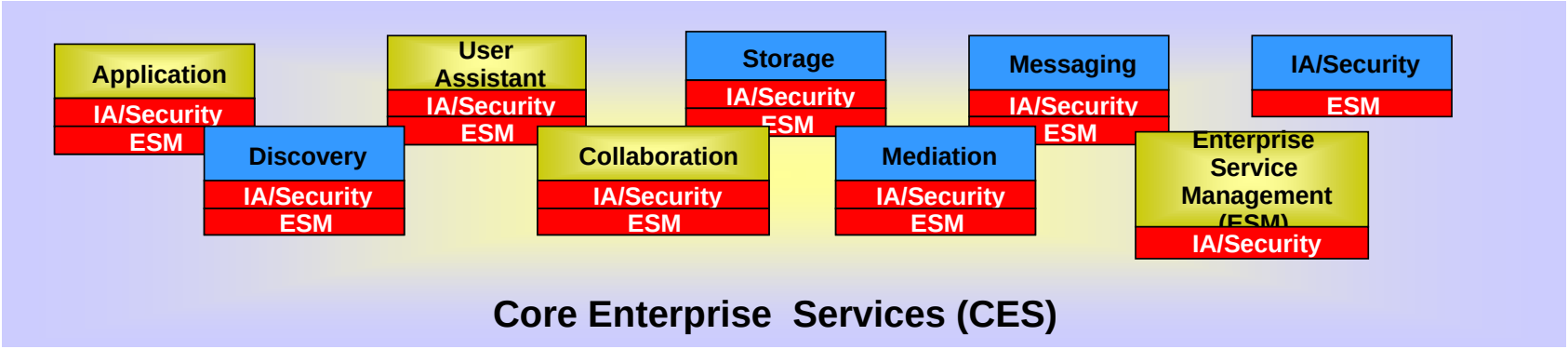
ABCS 6.4+

FCS Interoperability Approach



Analysis: SoSCOE & NCES Interop

- Key communications and protocol level interoperability provided by Interoperability Service of SOSCOE
- Mission Performance and QoS drives interactions with all CES but the key drivers are highlighted in blue



= required interoperability with SoSCOE

Interoperability Focus Areas

- **Presentation**
  - Integration into presentation layers
- **Workflows**
  - Workflow Model
- **Services**
  - Service Model
- **Data**
  - Models
  - Storage
- **Communications**
  - Connectivity
  - Discovery
  - Communications
  - Security
  - Network Impacts

Our primary focus is here.

What are each supporting?

Aspect	NCES	SoSCOE
Focus	DoD Enterprise	Army Tactical C2
C2ISR	Yes	Yes
Security	Primarily Intra Enclave Security	Primarily Intra Enclave Security
Real Time, Safety Critical Weapons	No	Yes
Portability	Important. Very Java centric	Primarily C++, Difficult portability Environment
Scalability / Availability	Designed to provide highly available services to many users	Decentralized, autonomous operations in many vehicles. Scale by adding vehicles
Performance/QOS	Focused on QoS at a location (i.e. guaranteed video)	Focused on sending most relevant data over limited bandwidth
SBA Focus	Open/COTS Based SBA – Web Enabled, Web Service Enabled, Published Metadata	Custom Developed SBA – Custom discovery, transport, dissemination, workflows, etc.

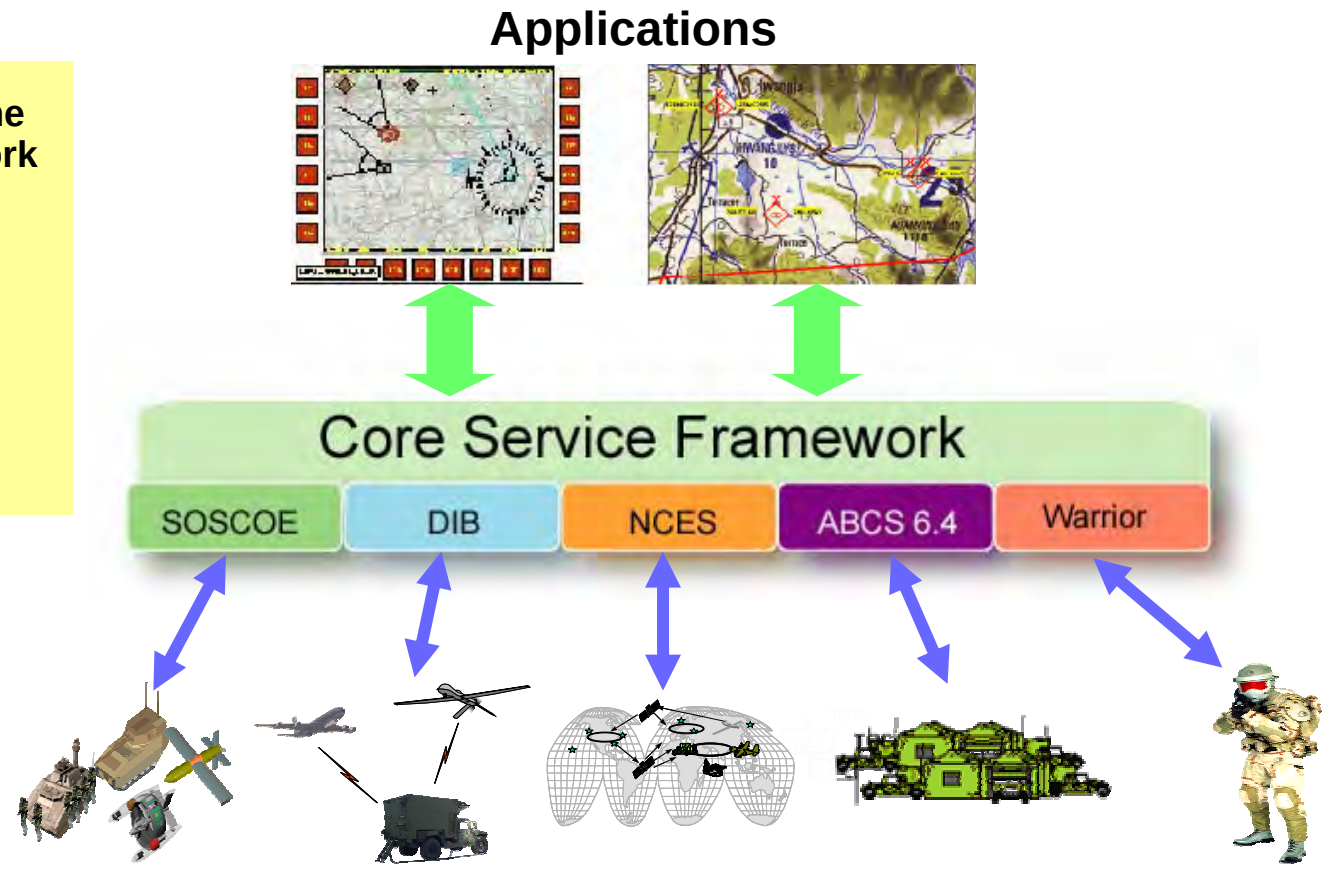
NCES/SOSCOE Interoperability Issues

#	Area	Issues
1	Discovery	Different discovery metadata and mechanisms prevent service discovery.
2	Encryption	Different encryption prevents service interoperability.
3	Identity / RBAC	Different identity and RBAC schemes prevent authentication / authorization.
4	Workflow	Different workflow models prevent workflows of services from NCES and SOSCOE.
5	Transport	Different transport mechanisms prevent service interoperability.
6	Interface Lang	Different service interface languages prevent service communication.
7	Metadata	Different languages for data and lack of SOSCOE metadata prevents data interoperability.
8	Data Models	Different data models require translators for interoperability.
9	Network Protocols	Non-standard SOSCOE network protocols prevent email, chat, and collaboration interoperability.
10	QoS	Compliance to the WIN-T / JTRS QoS scheme by FCS and non-FCS systems is required for effective bandwidth utilization.

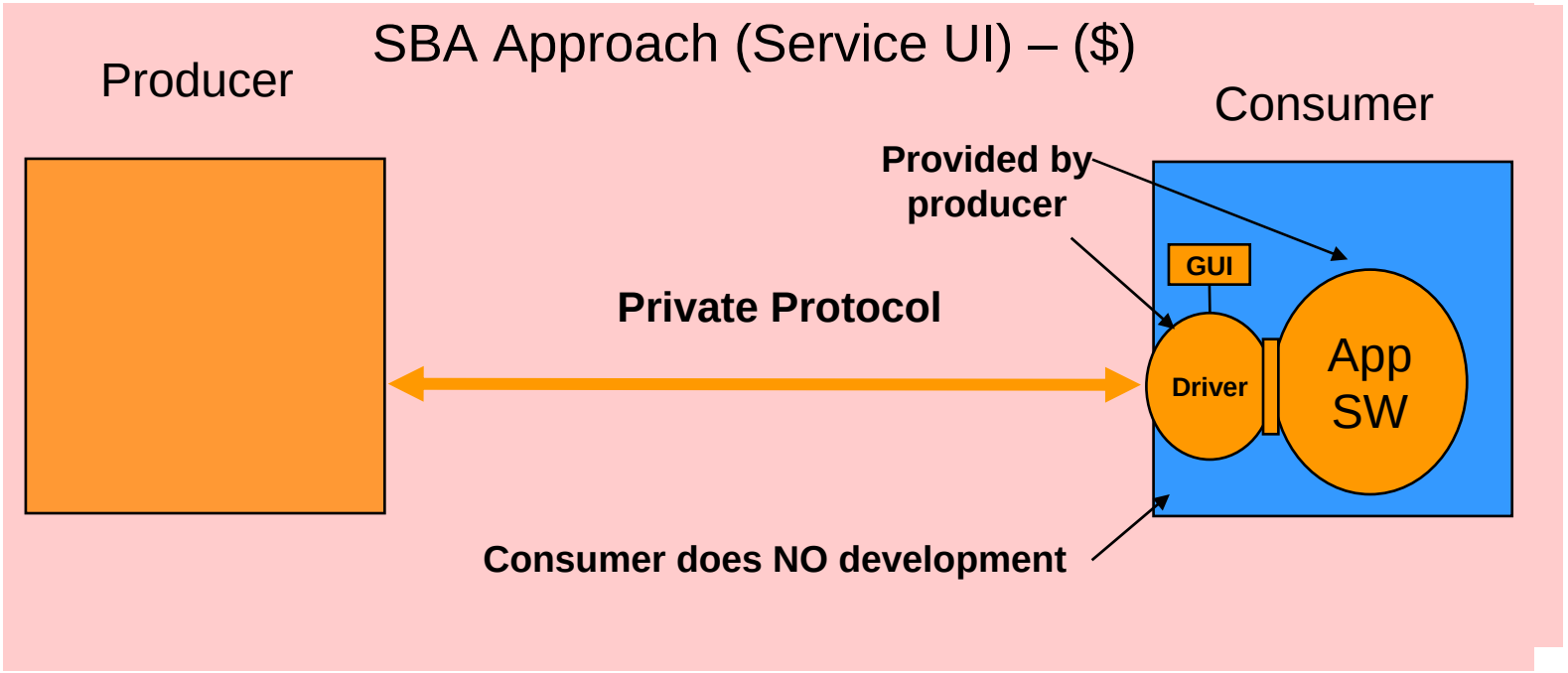
Designing for Interoperability

Services addressed in the Core Service Framework

- Security
- Discovery
- Data Storage & Mediation
- Visualization
- Messaging
- Workflow
- Alerts



Managed Connectors

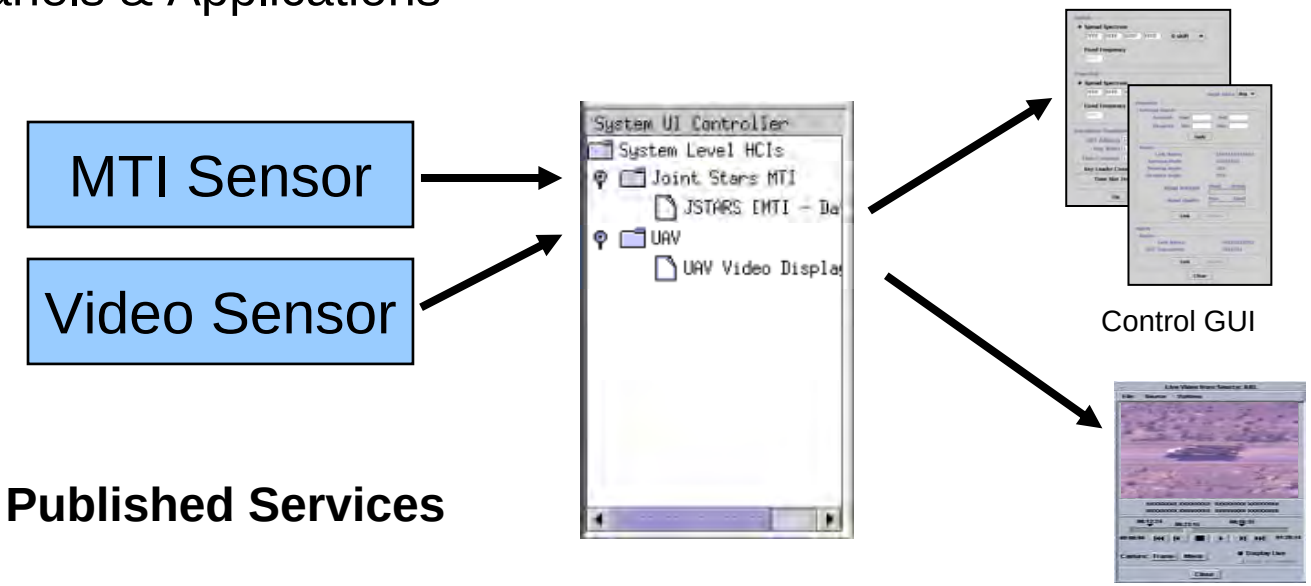


GENERAL DYNAMICS
C4 Systems

Example Frameworks

System Framework

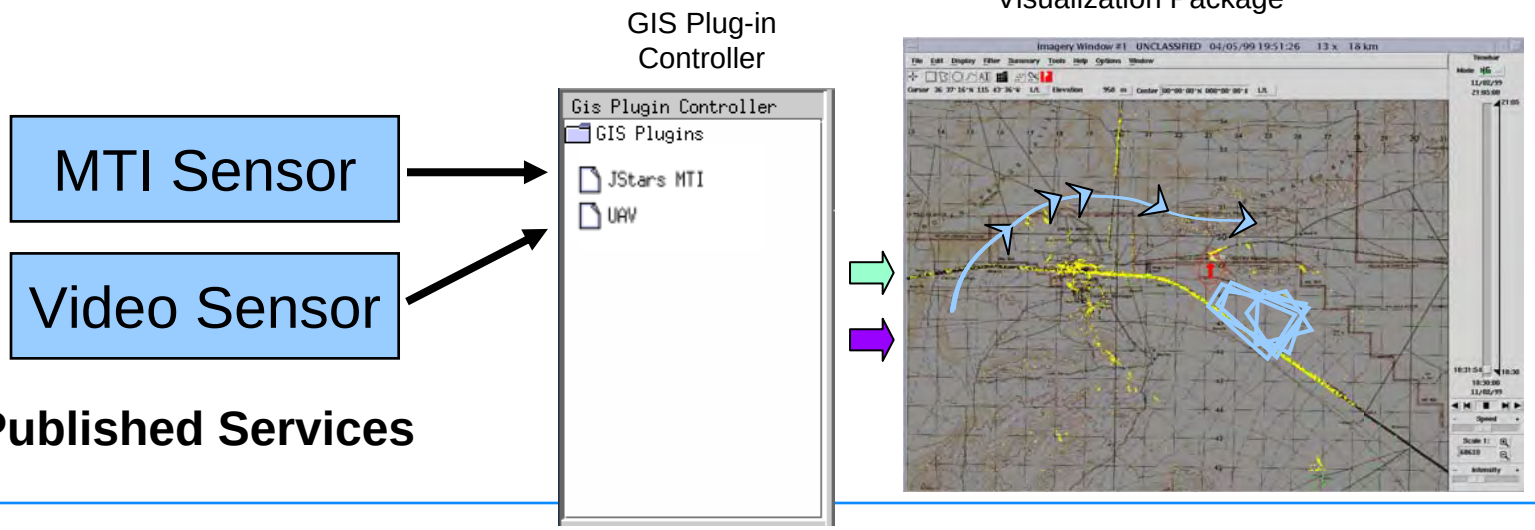
- **System User Interface Components**
  - ↗ Provided by devices as they are inserted into the system
  - ↗ Provides system level control panels & Applications
- **System UI Controller**
  - Detects and registers GUI services
  - Provides the interface for an operator to launch GUIs



Published Services

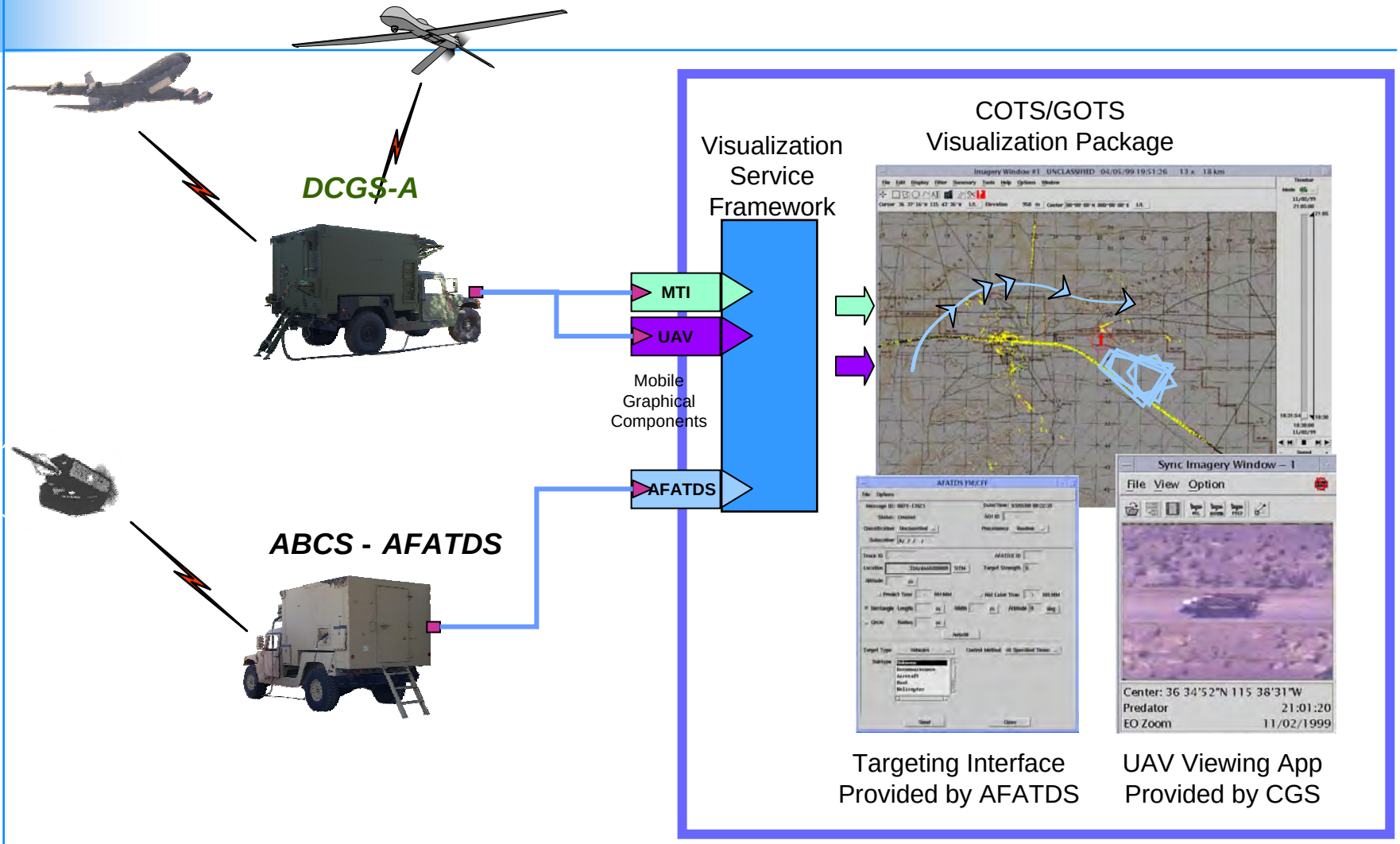
Visualization Framework

- **GIS Plug-In Components**
  - Mobile components that provide the the ability to display geo-referenced information
  - Understands the data and how it should be represented
- **GIS Plug-In Controller**
  - Detects and registers GIS Plug-In components
  - Translates the “normalized” calls into the appropriate calls for the GIS



Published Services

Distributed Services



Summary

- **Interoperability needs to encompass more than just data**
  - Other factors such as Discovery, Security, Messaging and Workflow need to be considered as well

- **Managed connectors and Service Frameworks are a viable mechanism for achieving application interoperability and portability**

THANK YOU

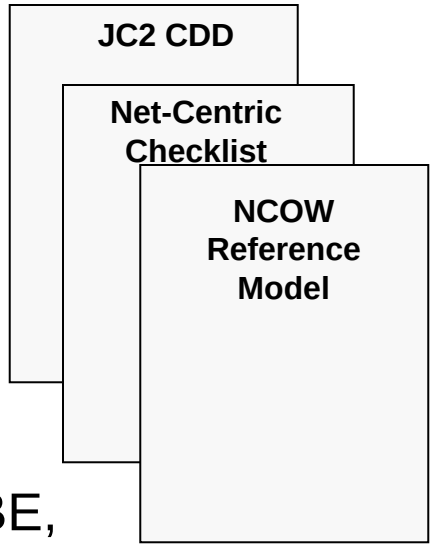
Joint Command and Control In a Net-Centric Environment

John Wellman
J88, USJFCOM

JC2 Concept

- JC2 will be a key Contributor to building the DoD C2 Domain…but not the only Contributor
- JC2 will use/integrate with GIG Enterprise Services
- JC2 will be implemented using a Service Oriented Architecture that is monitored and managed
- JC2 will allow Operational Users to link services to create managed workflows and processes
  - Process-centric, not application centric
- The GCCS Family of Systems will evolve to the JC2 Family of Capabilities using a spiral process to reduce risk
  - Federated development
  - Pilot service

What's Transformational About This Approach?



JC2 should:

- Employ a single, joint architecture
  - Network centric
  - service-oriented (providing re-usable functional utilities)
  - monitored & managed
- Employ NCES core enterprise services
- Leverage the transformational bandwidth gains of GIG-BE, TC and JTRS
- Deliver warfighter-relevant Mission Capability Packages (MCP)
  - Warfighter's Processes orchestrate data and applications
  - Dynamic workflow through the process
  - Re-usable services

JC2 Capability Transformational Vision

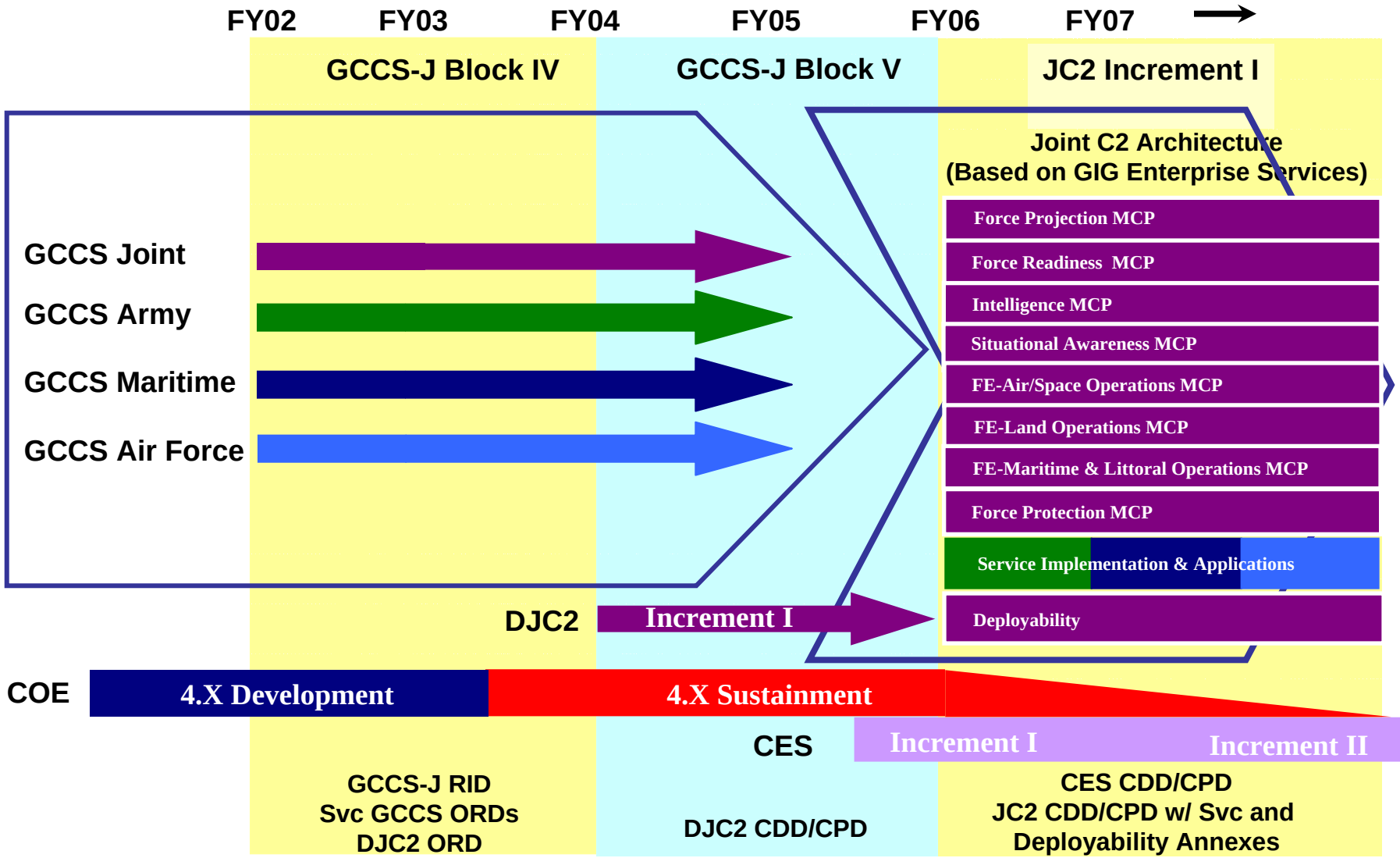
- GCCS will evolve from its current state of joint and Service variants to a single Joint C2 architecture and capabilities-based implementation
  - Trained personnel, policy, procedures and joint mission capability packages based on GIG/NCES infrastructure required to plan, execute, monitor, and assess joint and multinational operations
  - Operate in garrison/deployed network environments providing secure access to Service/Agency/joint-provided data sources and applications (e.g. GCSS) and will support information exchange across multiple security domains

Note: Services, STRATCOM, etc may eventually define other similar JC2 capabilities subset packages -- augmented by unique, custom capabilities

What is Transformational about this?
Knitting the applications, services and data into a *Complete, Managed Process*

JC2 Capabilities-Based Need

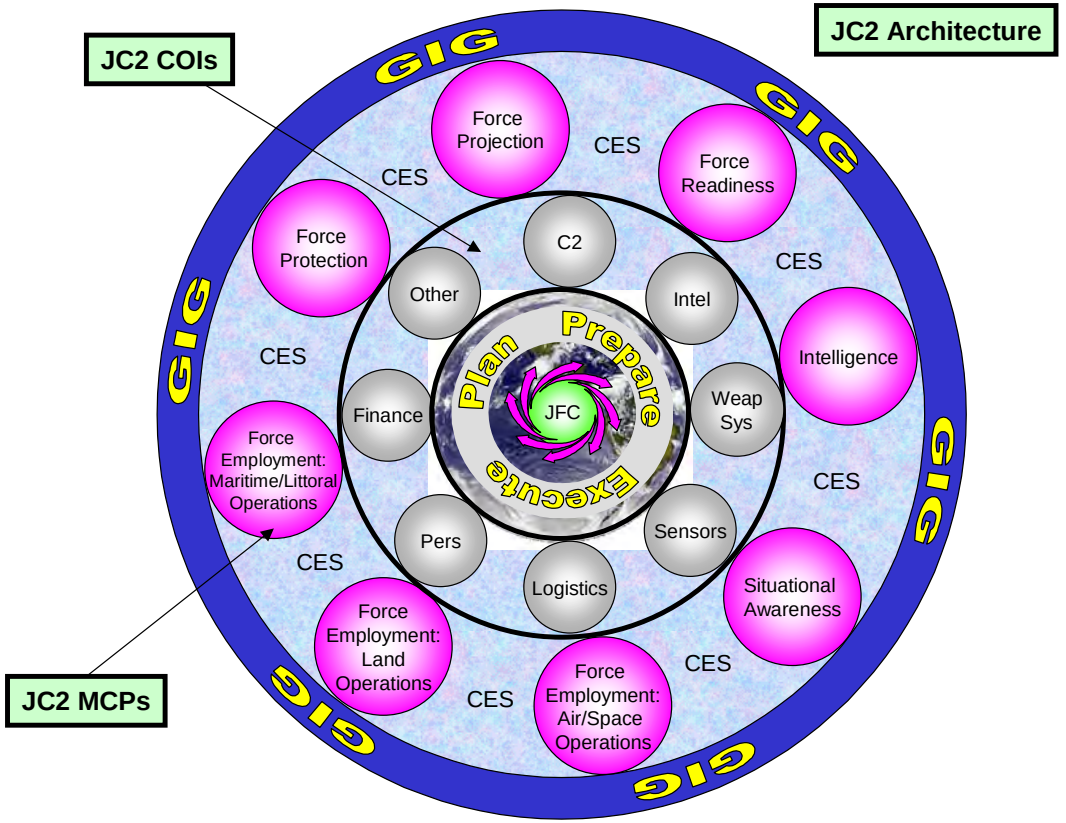
JC2 CDD



COE: Common Operating Environment CES: Centric Enterprise Services MCP: Joint Mission Capability Packages

JC2 Capability

- **USJFCOM provides oversight and sponsorship of Joint C2 requirements/ capabilities**
  - JROCM 167-03, 22Aug03 -- ORD approval authority, for non-KPP adjustments, delegated to USJFCOM
- **Migrate to a single joint C2 architecture**
- **Support joint C2 rqmnts from NMCS thru Joint Force commander to components**
- **Organized along 8 joint Mission Capability Packages and cross-functional services**



JC2 OV-1

NMCS: National Military Command System

Back-up Slides

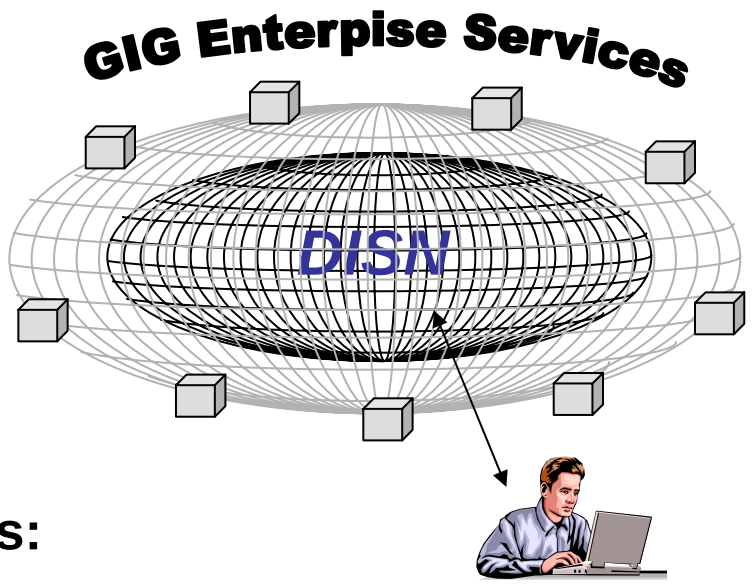
JC2 Will Run on GES

JC2 View

- Essential Core Services:
  - Security (access and authentication)
  - Discovery (registration and search)
  - Enterprise System Management
- Leveraged Core Services:
  - Messaging
  - Collaboration
  - Mediation
  - User Assistant
- Leveraged Core Computing Services:
  - Storage
  - Application Processing

- Essential C2 Common Service
  - Mission Tailorable Operational Picture
  - Others TBD

(Not GES)



User deployed anywhere in the world

Service Oriented Architecture

Service Oriented Architectures provide greater capabilities and more flexibility then today's Platform Oriented Architectures

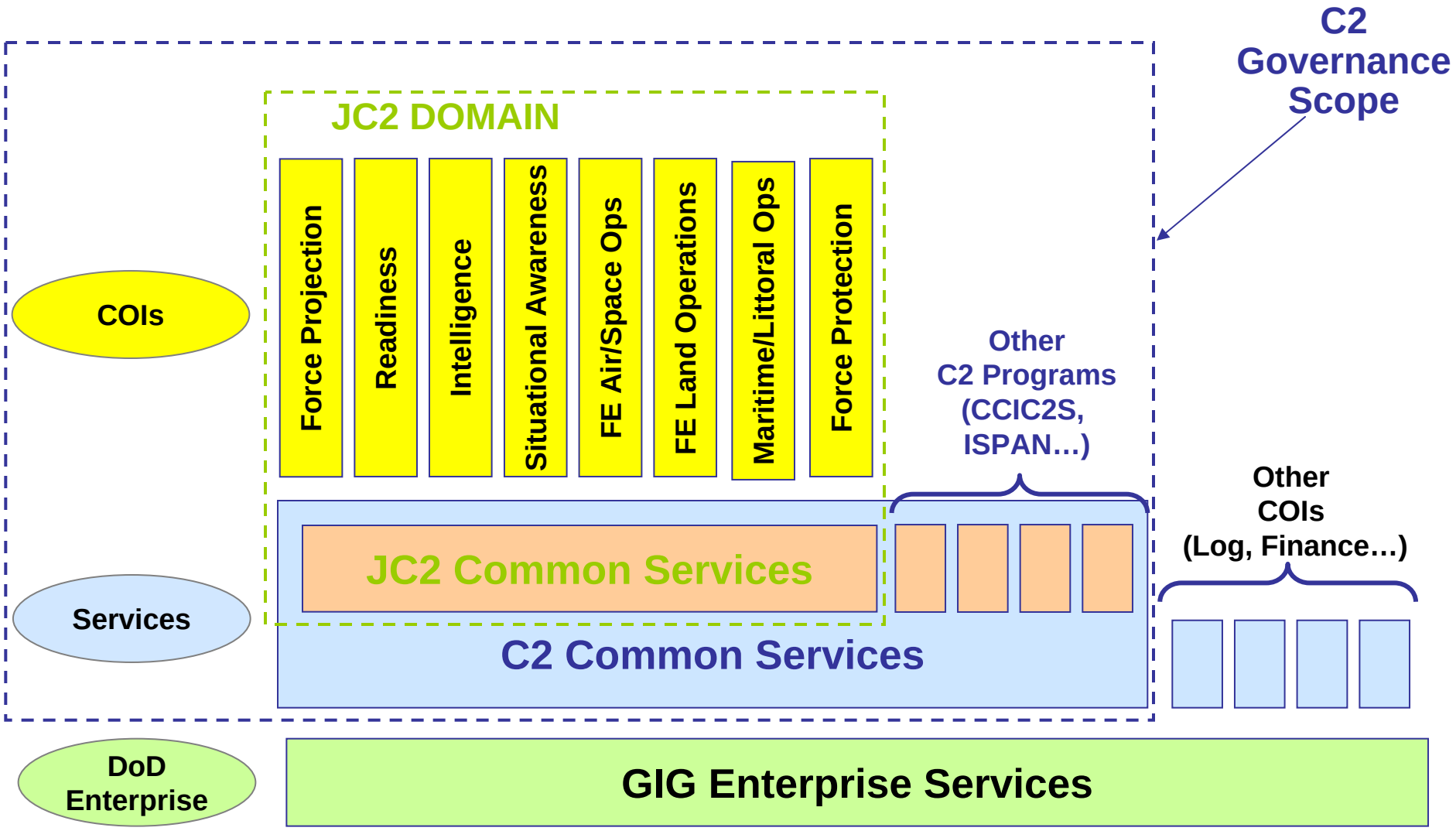
- **A service provider can be:**
  - A source of data to DoD end-users and systems or MCPs
  - A provider of a value-added service, such as multiple source data fusion, track management, translation, syndication, or content filtering;
  - or a provider of a core enabling service for the enterprise
- **From the consumer's point of view services are:**
  - "Black boxes" on the network, in the sense that their internal implementation is hidden.
  - A service's inputs are specified and its outputs are returned, however, from the consumer's point of view on the outside, the service implementation remains unknown.

Implications of Service Oriented Architectures

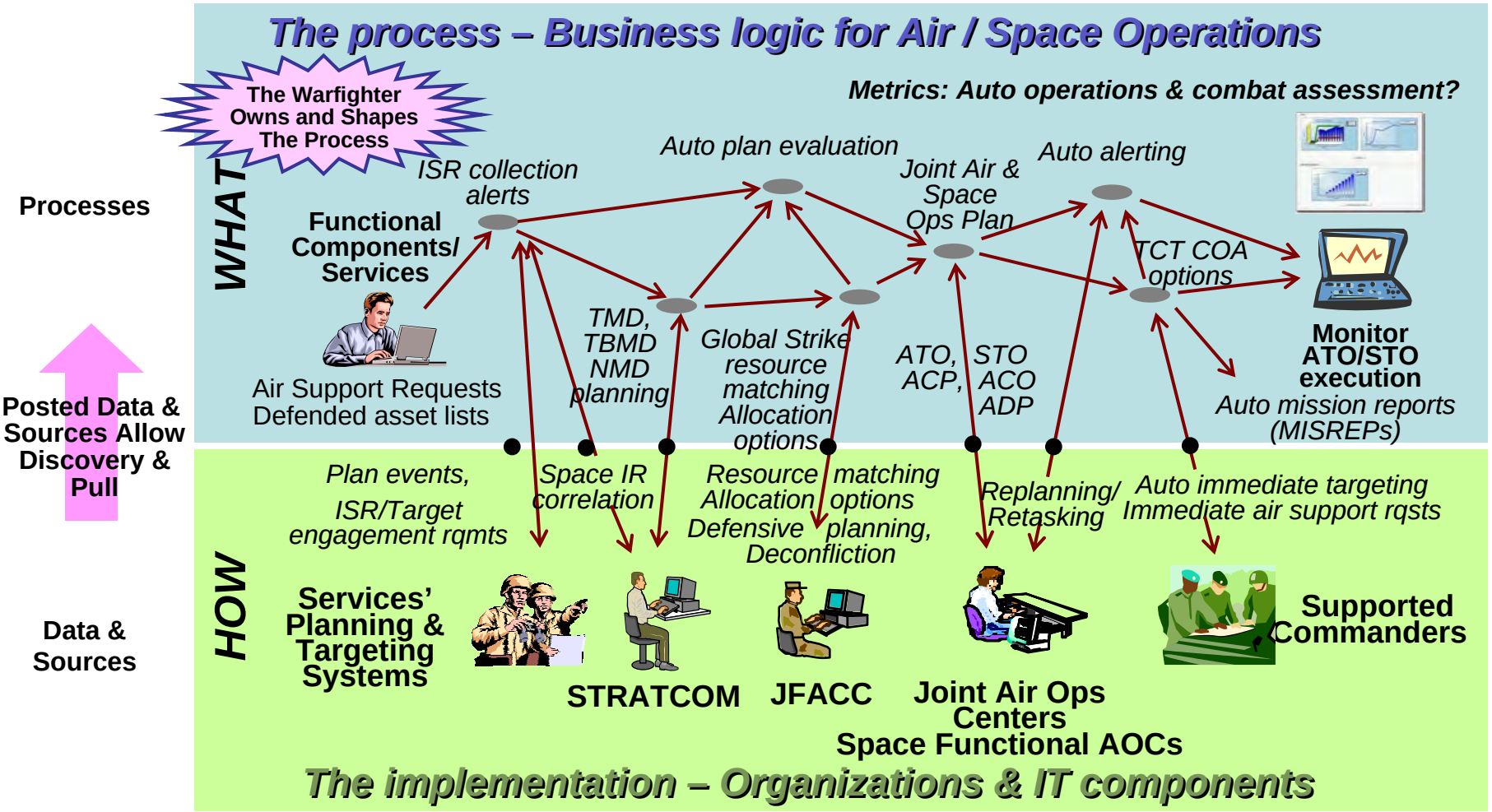
- **Services provide many Operational Benefits**
  - Faster delivery of new capabilities
  - Improved Backwards Compatibility
  - Competition/best of breed among Service Providers
  - Service Providers do not control the End User computing environment
  - Less risk in migrating from GCCS Family of Systems to JC2
- **There is nothing to do with specific technologies here**
  - Some technologies may help
  - But providing you implement these principles, anything will do – *messaging, FTP, e-mail, batch tables, etc*
- **And note the implication for business processes:**
  - Service oriented architectures are most consistent with homogenized, streamlined business process across the enterprise
  - **Full scale implementation will involve process re-engineering**

A Service Oriented JC2 Architectures will enable a quantum leap in Warfighter decision superiority

Conceptual JC2 in Context

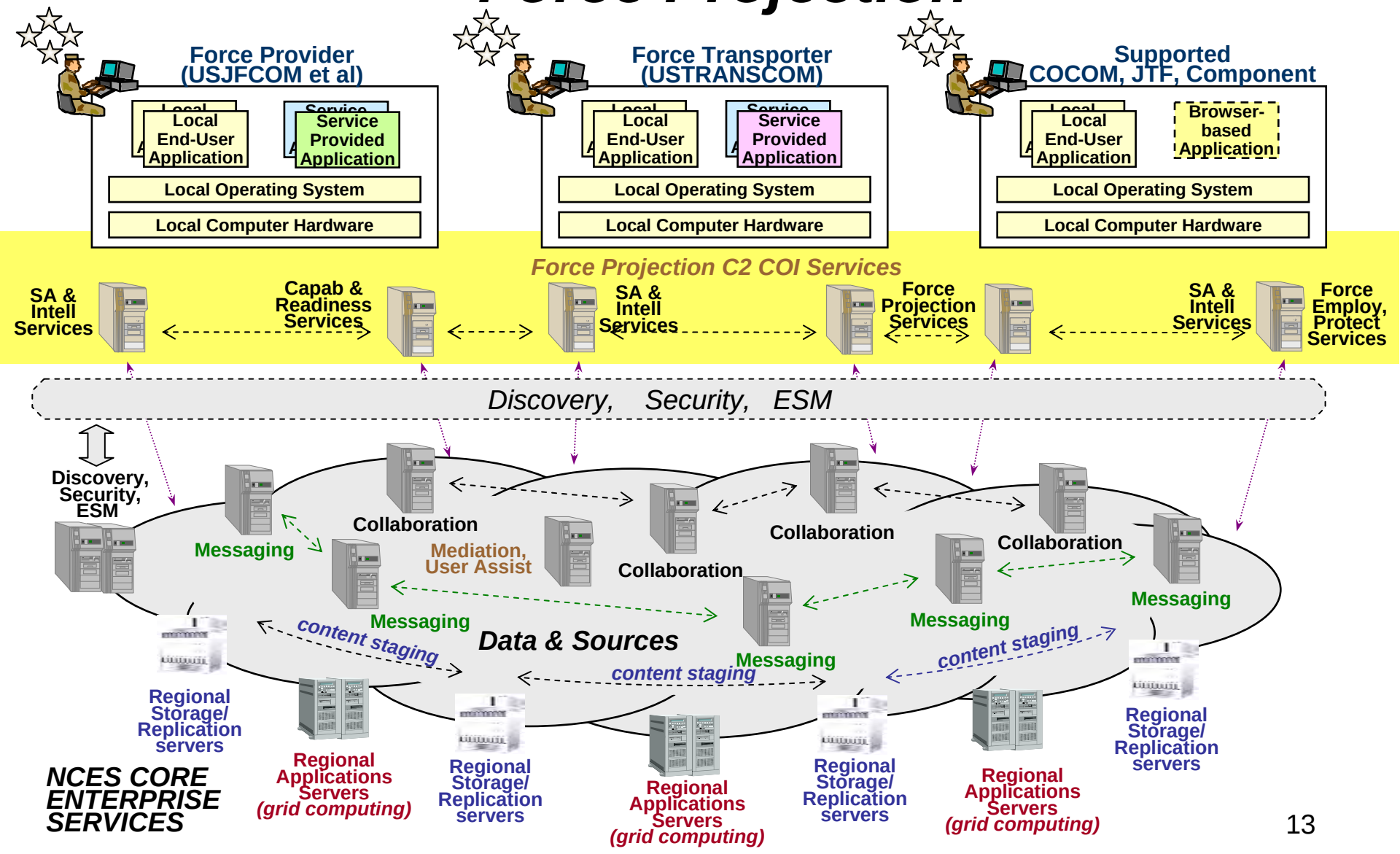


JC2 Operational Concept
Air/Space Operations MCP

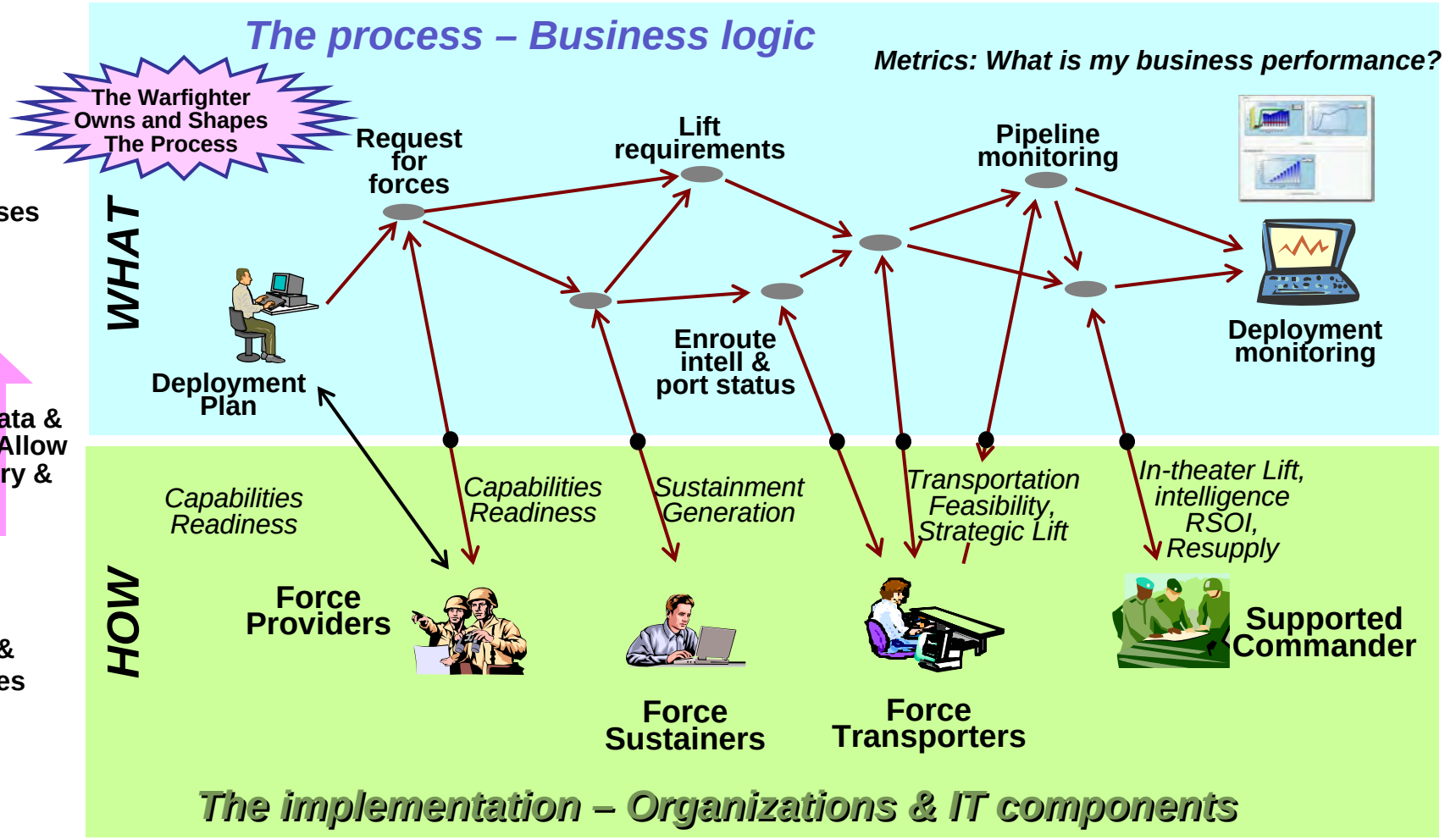


Net & Data Centric, Process Oriented

Possible JC2/NCES Architecture for Force Projection

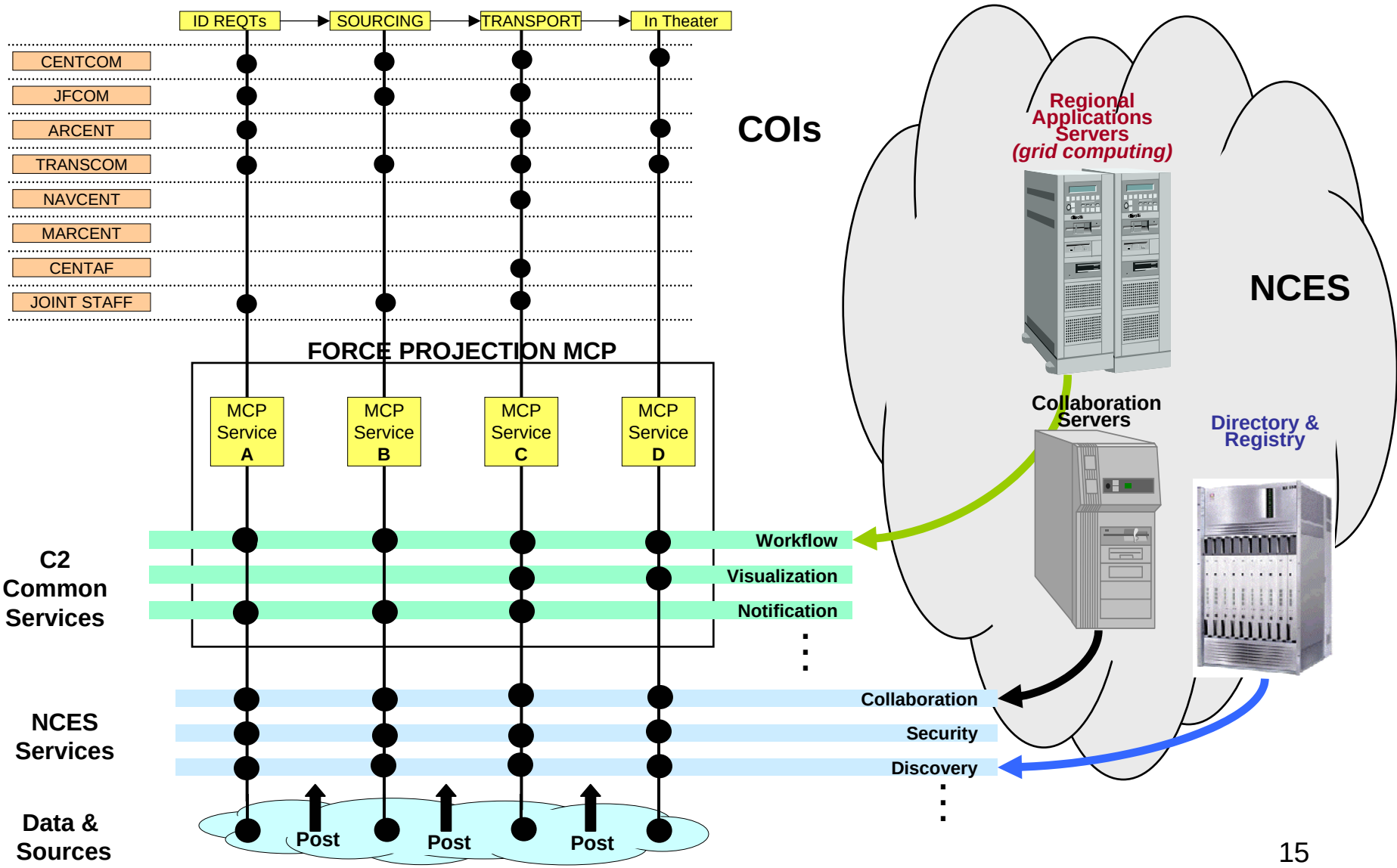


JC2 Operational Concept
Joint Deployment MCP



Net & Data Centric, Process Oriented

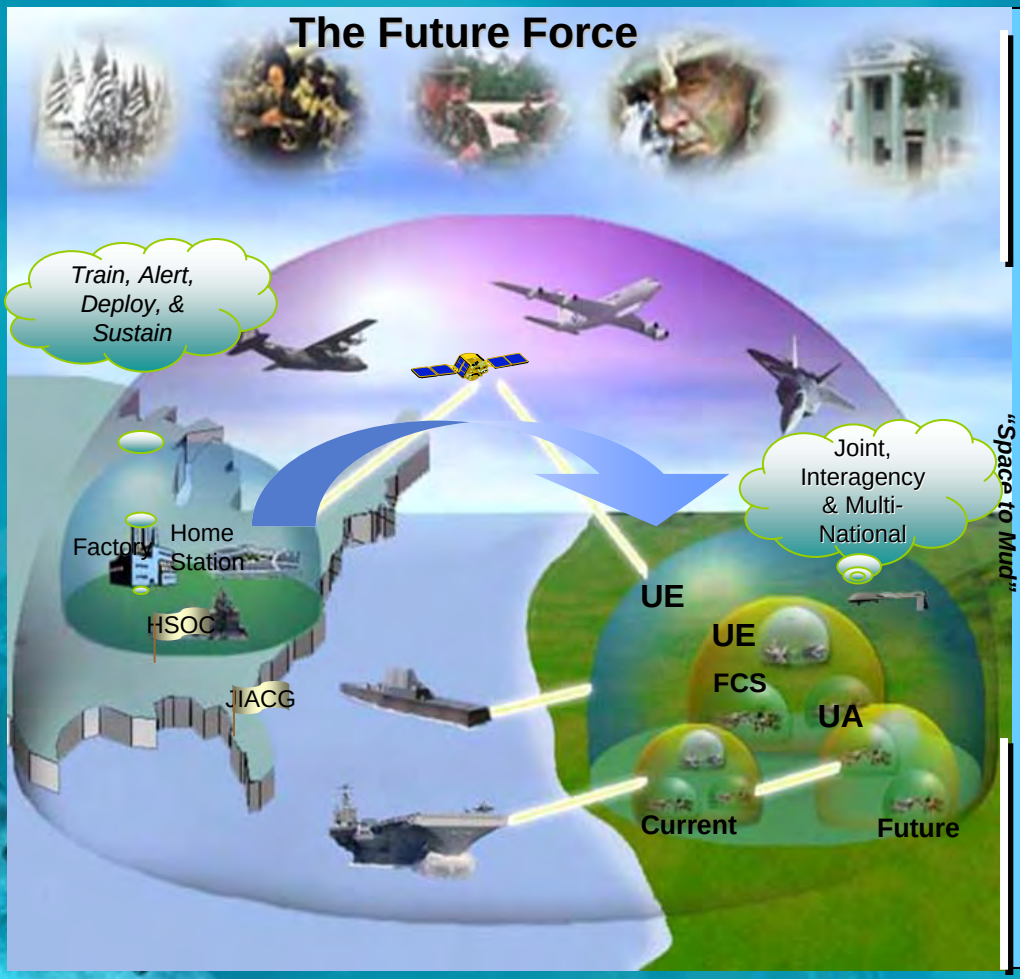
Force Projection Web-Centric Process



Net Centric Operations, Interoperability, and Systems Integration Conference

Lieutenant General Joseph L. Yakovac, Jr.
Military Deputy To The
Assistant Secretary Of The Army
(Acquisition, Logistics And Technology)
21 March 2005

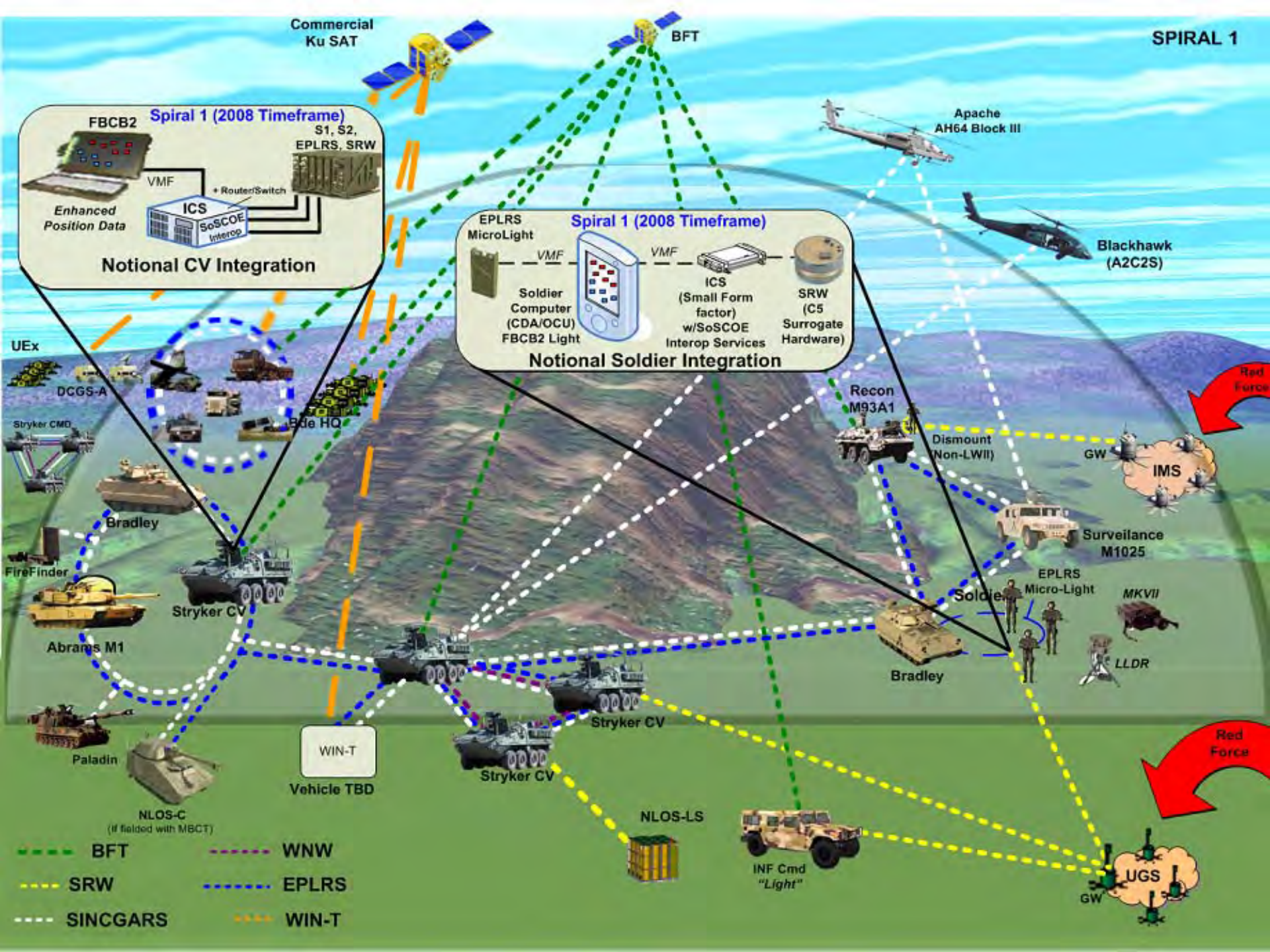
Managing Complexity: Future Force Capabilities



- **Future Force Characteristics – Responsive, Deployable, Agile, Versatile, Lethal, Survivable, Sustainable…**
- **A New Way of Joint Warfare**
  - Dominant Situation Awareness
  - Networked Weapons Systems
  - Joint Interdependence to Small Unit Level
- **More Strategically Responsive Land Force**
  - Lighter, More Air and Sea Transportable
  - Reduced Sustainment Footprint/ Reachback/3 Days Combat w/o Re-Supply
- **Technology Enabled -** Spiral Development/ Insertions
- **Capabilities Based Force** for Combatant Commanders Now. . .Future!

See First
Understand First
Act First
Finish Decisively

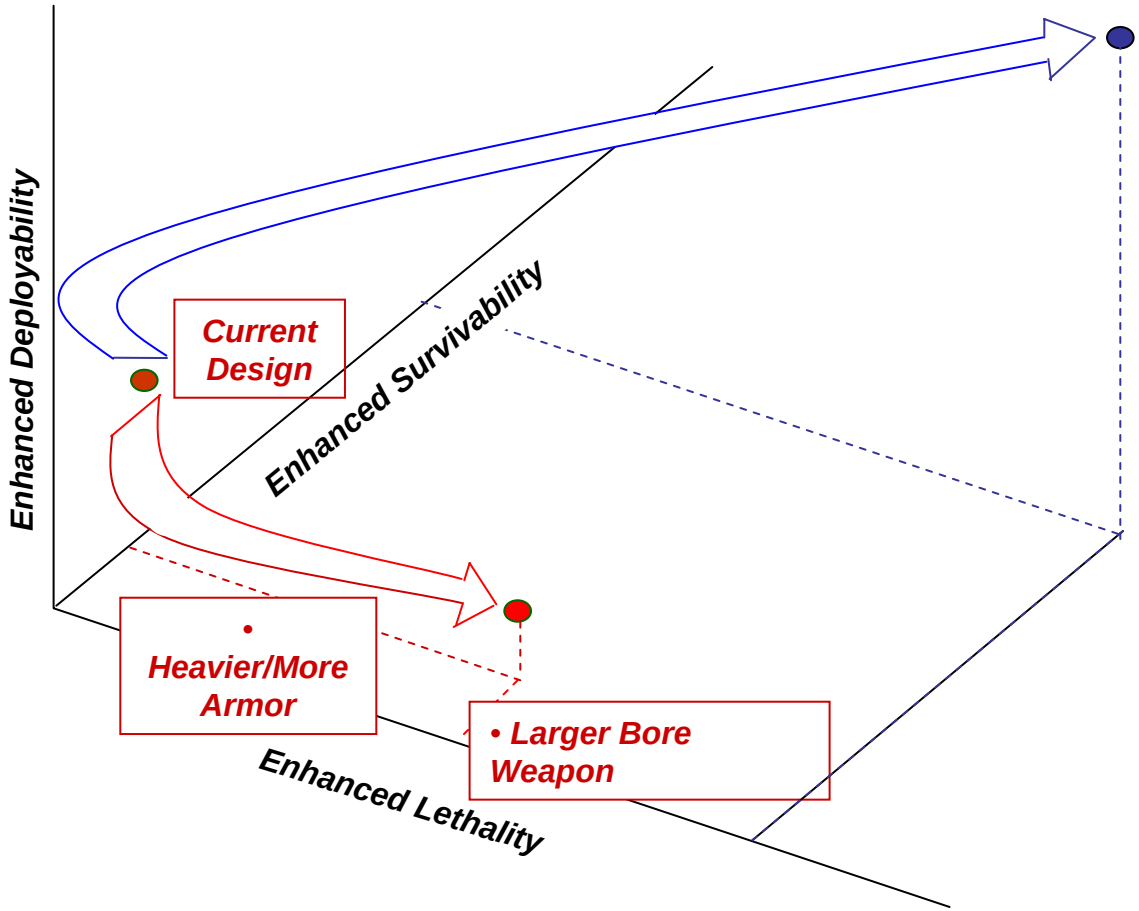
Supports National Security and Military Strategies


SPIRAL 1
Commercial Ku SAT
BFT
Spiral 1 (2008 Timeframe)
FBCB2
S1, S2, EPLRS, SRW
VMF
+ Router/Switch
ICS
SoSCOE Interop
Enhanced Position Data
Notional CV Integration
Spiral 1 (2008 Timeframe)
EPLRS MicroLight
VMF
VMF
Soldier Computer (CDA/OCU) FBCB2 Light
ICS (Small Form factor) w/SoSCOE Interop Services
SRW (C5 Surrogate Hardware)
Notional Soldier Integration
Apache AH64 Block III
Blackhawk (A2C2S)
UEx
DCGS-A
Stryker CMD
Blue HQ
Bradley
FireFinder
Stryker CV
Abrams M1
Paladin
NLOS-C
(if fielded with MBCT)
WIN-T
Vehicle TBD
Stryker CV
Stryker CV
NLOS-LS
INF Cmd "Light"
Recon M93A1
Dismount Non-LWII)
GW
IMS
Red Force
Surveilance M1025
EPLRS Micro-Light
Soldier
MKVII
LLDR
Bradley
Red Force
UGS
GW
BFT
WNW
SRW
EPLRS
SINCGARS
WIN-T

Survivability
Leading To New Design Paradigm

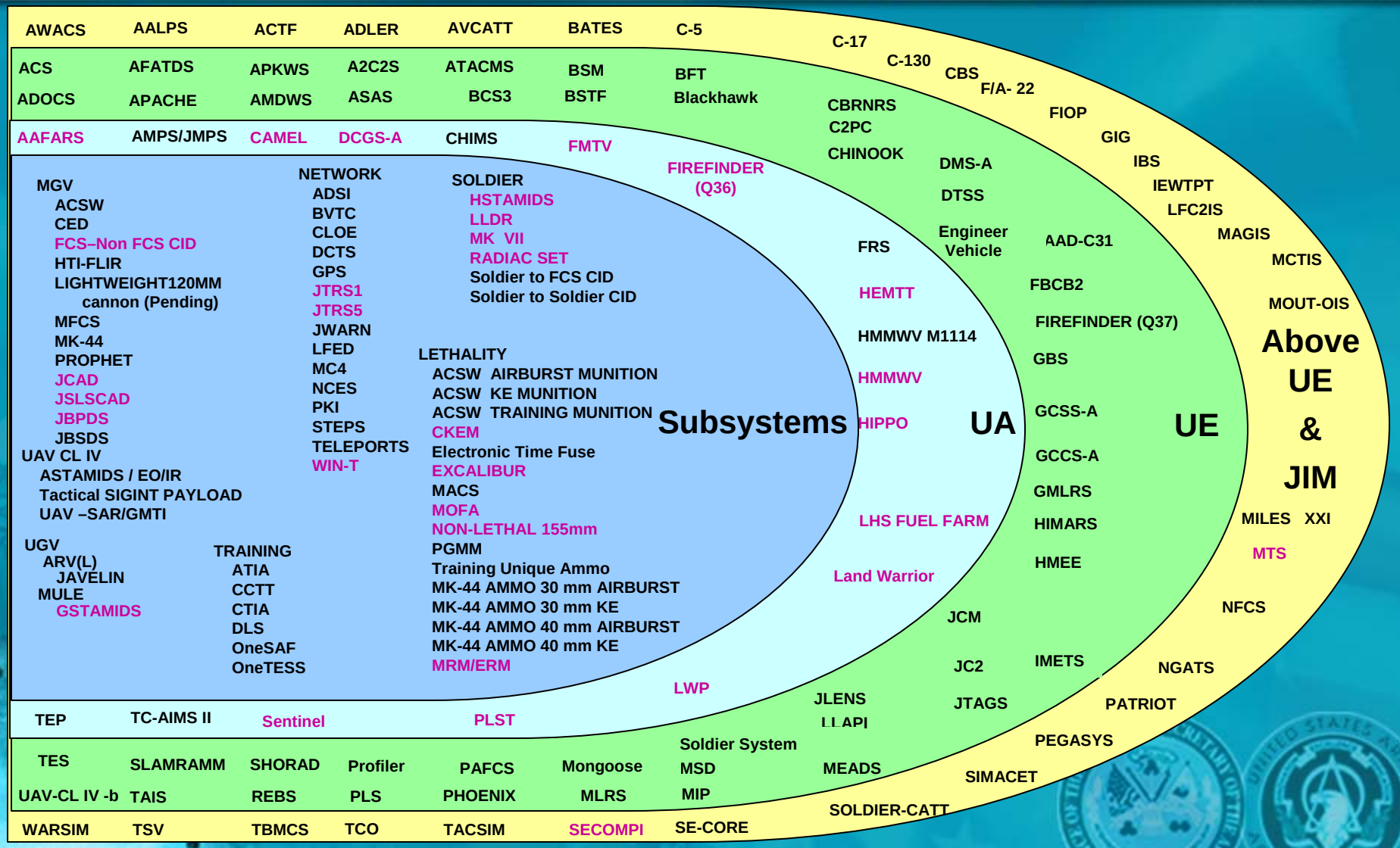
Conventional Design Process Improves Survivability at a Loss in Deployability

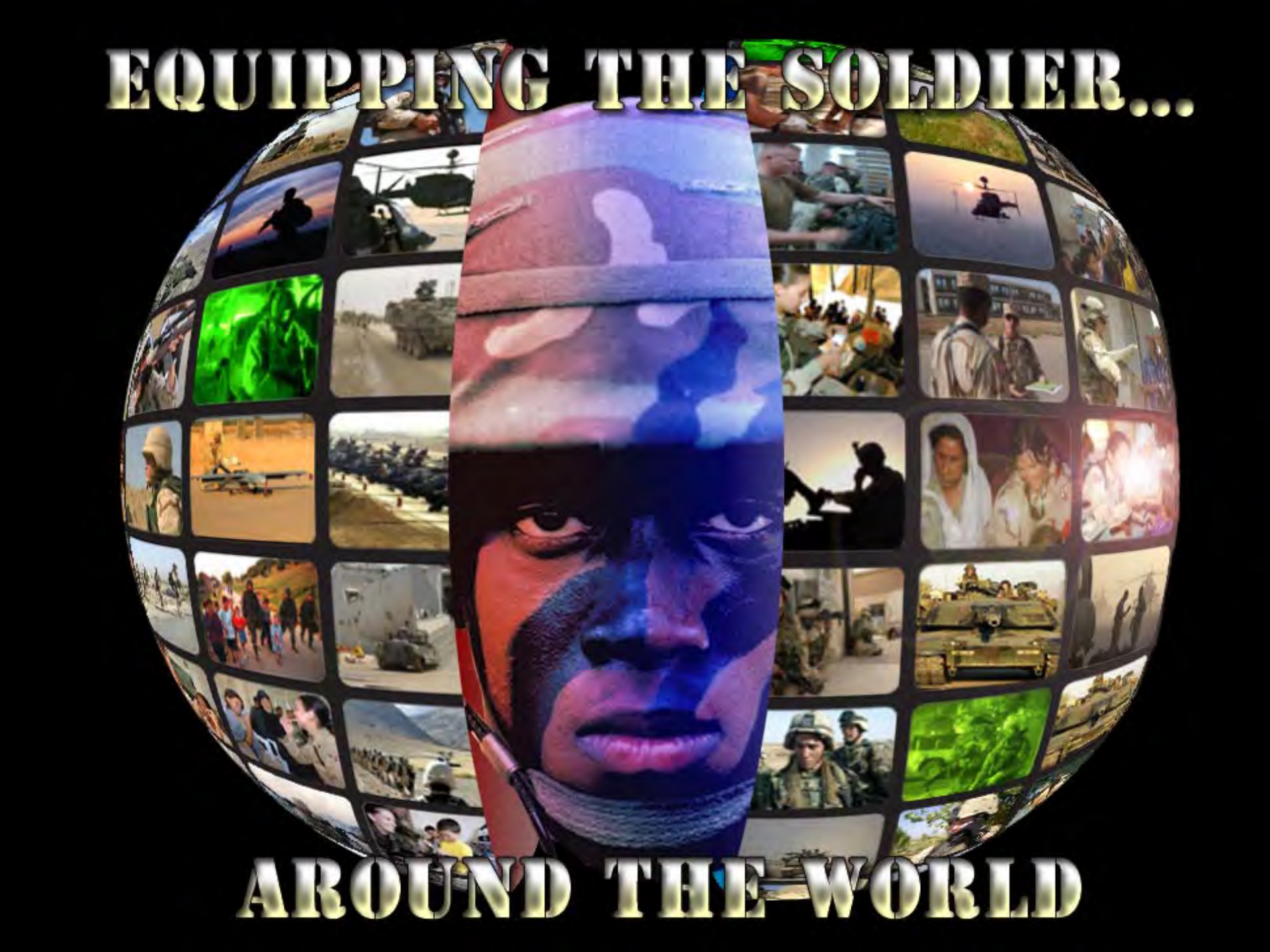
New Design Paradigm Improves Both Survivability and Deployability



- *Training, Simulation & Experimentation*
  - *Multi-skills*
  - *Embedded Training*
  - *Live, Virtual and Constructive*
- *Situational Awareness*
  - *Network/Communications*
  - *Sensors*
  - *Information Processing*
  - *Decision Aids*
- *Survivability Design*
  - *Armor*
  - *Active Protection*
  - *Signature Management*
  - *Deception and Countermeasures*
- *Vehicle Attributes*
  - *Speed/Agility*
  - *Size and Shape…Terrain Masking*
  - *Manned/Unmanned*
- *Lethality*
  - *Weapons Mix*
  - *Engagement Distances*
- *Relationships Between Platform Elements*

FCS Complementary/Associated Systems Interfaces




EQUIPPING THE SOLDIER...
AROUND THE WORLD