



# **Joint Battlespace Management Command & Control: An Industry Perspective**

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**LOCKHEED MARTIN**



# Overview



***“The conduct of war for US and allied coalition partners is transforming from platform-centric to network-centric concepts. The precision engagement operational concept is changing as well...”***

- **The Heart of Transformation**
- **Developing Interoperable Systems**
- **Overarching Joint C2 Systems**
- **Lockheed Martin Participation**

# The Heart of Transformation - Dr. V. Garber

- ***Rumsfeld: “Interoperability can be simply taking what we have and making it work together in a way that is transformational”***
- ***DoD 5000 and CJCSI 3170 are final***
  - *Capabilities based acquisition*
  - *Architectural discipline to ensure interoperability*
- ***CJCSI 3170 – key Joint Functional Concepts***
  - *Battlespace awareness*
  - *Command & Control*
  - *Protection*
  - *Force Application*
  - *Focused Logistics*
  - *Net-Centric*
- ***JBMC2 – Key to interoperability and systems integration***
  - *Bandwidth expansion*
  - *Standards of net-centricity necessary but not sufficient*

# Integrated Architecture



***An architecture consisting of multiple views (operational, systems, and technical standards) that facilitates integration and promote interoperability across family-of-systems (FoS)/system-of-systems (SoS) and compatibility among related mission area architectures.***

DoDD 4630.5, “Interoperability and Supportability of Information Technology and National Security Systems.” January 11, 2002

***“JBMC2 Integrated Architecture is the organizational and functional integration of the 3 architectural views and associated products that cross-cut multiple organizations (U.S. and/or multinational) vertically and horizontally at the National, Theater, CJTF and Tactical echelons with the purpose to obtain synchronized delivery and improvements of a fully integrated and interoperable joint BMC2 capability.”***

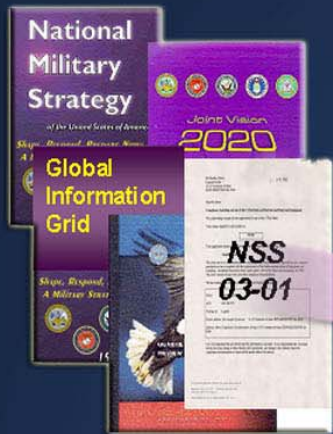
USJFCOM System Engineering Division, 10 July 2003

# Developing interoperable systems in an evolving capabilities-based requirements and acquisition environment



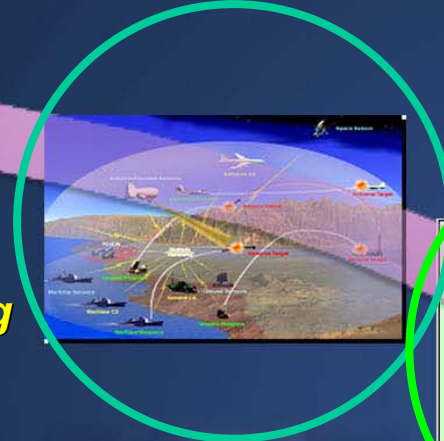
- **Transformation of Warfighting**
  - *Must consider full range of military Ops from the beginning (same platform might have different purposes from one day to the next)*
- **Problem with semantics and syntax between Gov't & industry**
- **What does the gov't mean when they say "capability"?**
  - *Joint Ops Concept – "Full spectrum dominance"*
  - *Ops Concept (plan) vs. ConOps (implementation)*
- **DoD 5000 and CJCS guidance**
  - *Fully integrated*
- **Initial Capability Document (ICD)**
  - *By phase, what the capability of the system should be*
- **Must transform in order to meet the needs of the military transformation**
  - *SoS Architecture => New OpsCon => Rapid concept design => Integrated warfare analysis center => Integrated warfare development => new ConOps => advanced prototype center => Demos*

# “Joint” Institutionalization

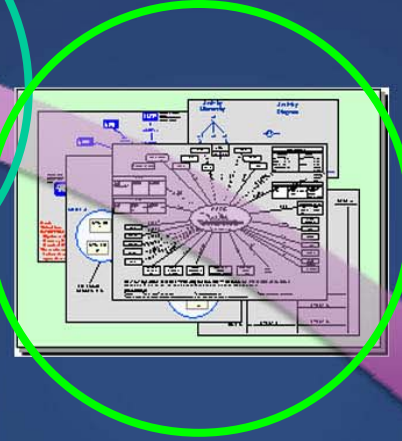


**Guidance Planning & Programs**

**Concepts**



**Integrated Architectures**



CJCSI 3170 (JCIDS)

**JROC**



**DAB**

- **DoDAF-Driven Process**
- **Architectures Set the Stage**
- **Capabilities Based Methodology**



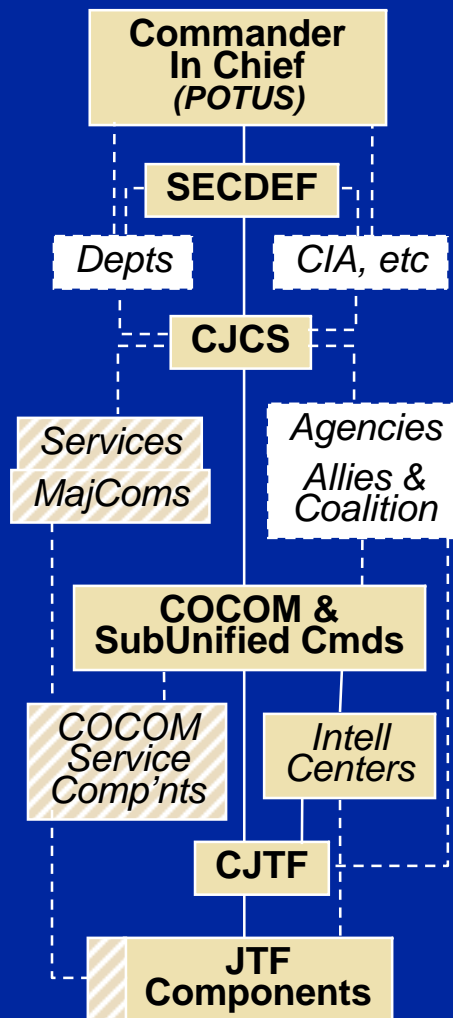
**Industry Participation is increasingly Earlier in the Process**

# Overarching Objectives of JC2



- ***Provide seamless Joint C2 from the Commander-in-Chief down to deployed Joint Force & Component headquarters***
  - ***Converge GCCS-J and Services' variants of GCCS onto a Common architecture***
  - ***Including GCSS as a component of GCCS***
- ***Make a quantum improvement in end-to-end C2 functional capabilities***
- ***Move to the Global Information Grid Network Centric Enterprise Services architecture***

# JC2 Objective 1: Provide seamless Joint C2 from the Commander-in-Chief down to deployed Joint Force & Component headquarters



*The JC2 capability will be the DoD principal command and control system*

*GCCS will evolve from its current state of joint and Service variants to a single Joint C2 architecture and capabilities-based implementation*

 = GCCS w/Services' applications



## JC2 Objective 2: Make a quantum improvement in end-to-end C2 functional capabilities



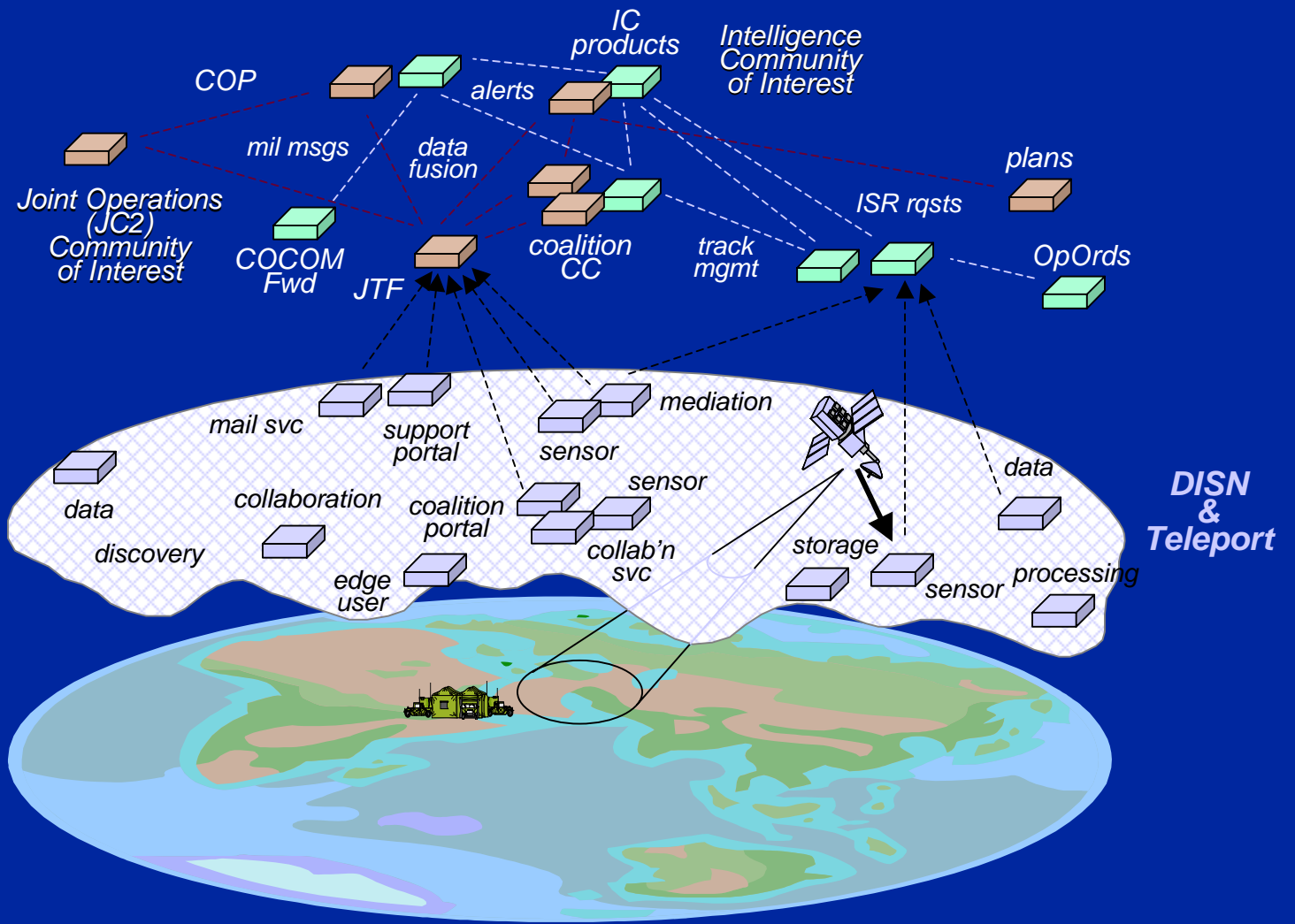
- **Situation Awareness:**
  - *Integrate all information necessary to support mission-specific decisions during concurrent planning and execution*
- **Intelligence:**
  - *Continuous IPB, ISR Mgmt, & targeting*
- **Readiness:**
  - *Capabilities-based availability vs time*
- **Joint Planning, Force Projection, Sustainment:**
  - *Integrated consideration of all military options, and continuous incremental global optimized movement of forces*
- **Force Protection:**
  - *Consideration of all threats, including the emergent asymmetric threat*
- **Force Employment – Air/Space Ops:**
  - *Realtime synchronization of air operations with ground operations*
- **Force Employment – Joint Fires/Maneuver:**
  - *Realtime synchronization of ground operations with air operations*

# JC2 Objective 3: Move to the Global Network Centric Enterprise Services architecture



**COMMUNITIES OF INTEREST**  
(& NCES  
COI-specific  
Services)

**NET-CENTRIC  
CORE  
ENTERPRISE  
SERVICES**

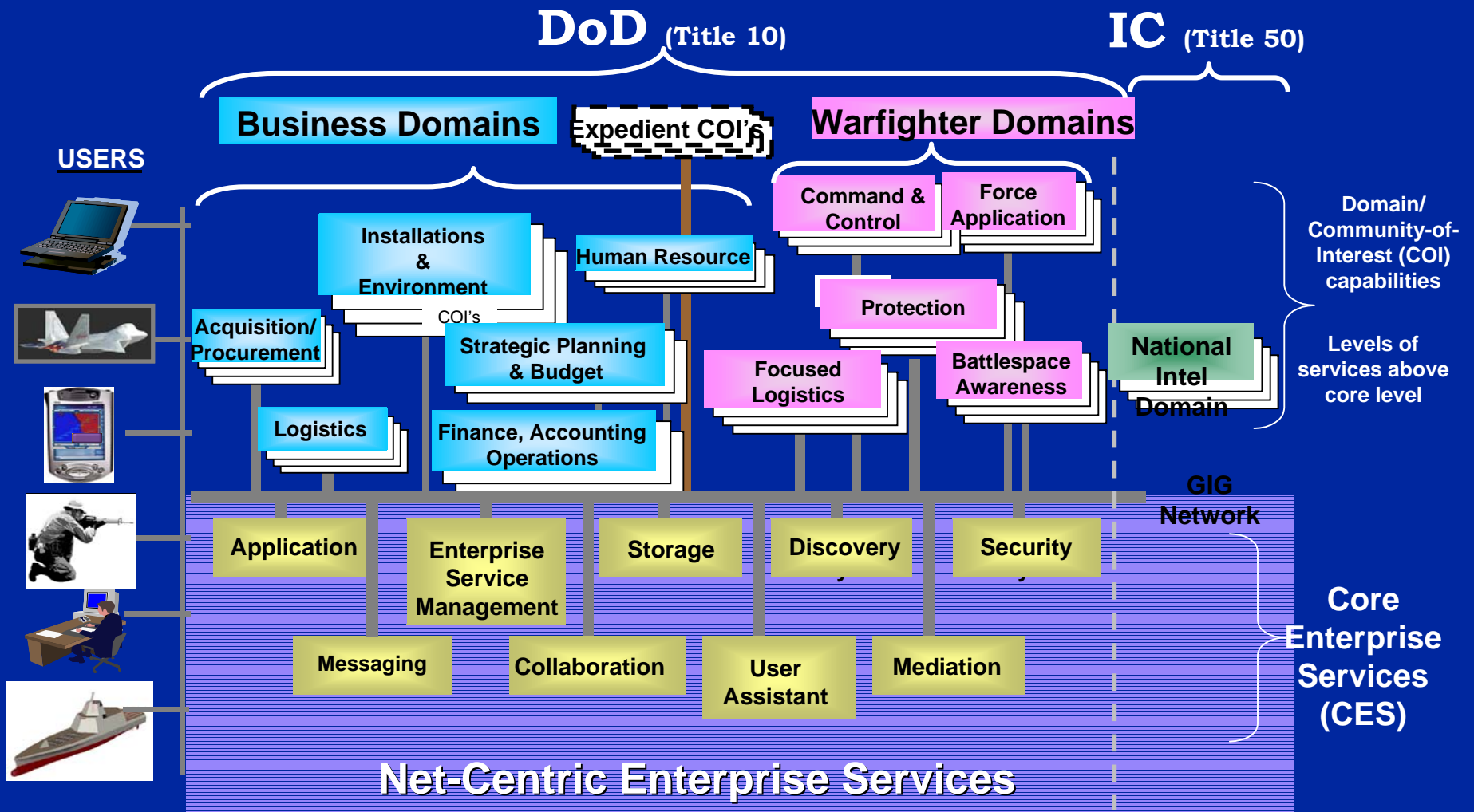


**How should all these components interact with each other??**

# Net-Centric Enterprise Services (NCES)



Support real-time & near-real-time warrior needs, and business users



# JC2 needs to consider web-based, MLS / MSL implementations

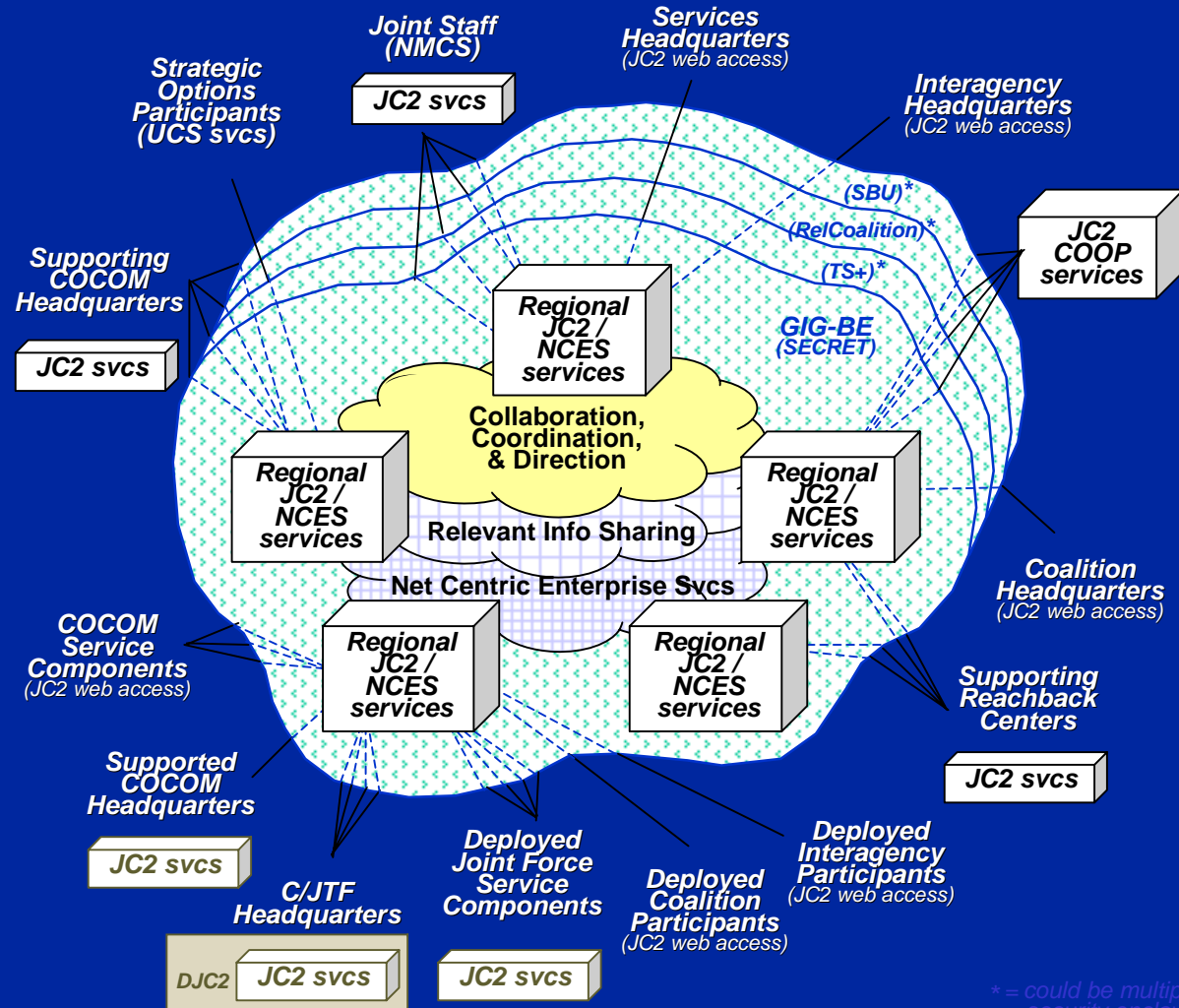


“JC2 will extend its C2 interoperability to support secure information exchange with allied, coalition, and non-DoD partners.

“Multinational partners will be able to securely access JC2 capabilities as required.

“JC2 will enable the DoD to exchange information and work closely with key federal agencies and multinational partners

(as described in the National Strategy for Homeland Security).”



# GVIC & Global Vision Network™

*Industry interface in an emerging Net-Centric Environment*



*Government & Defense Agencies*

- Interagency
- Integrated Solutions
- Common Systems



*Industry Partners*

- View from Industry
- Customer led Partnering
  - Leverage industry resources

*Uniformed Service/CoCom*

- JFCOM
- Services
- System Commands
- PEO / LABS



**Government/Industry Partnership**

*Global Vision Integration Center (GVIC)*

*Proof-of-Concept-Facility*

- Tactical to Operational to Strategic Levels
- Emphasis on Joint Campaign Analysis



**Lockheed Martin Global Vision Network™**

*Capabilities and Products*

- Facilitate SoS Solutions
- Integrated Architectures



*Programs and Initiatives*

- Gov't & Industry Investment
- On-Going Programs



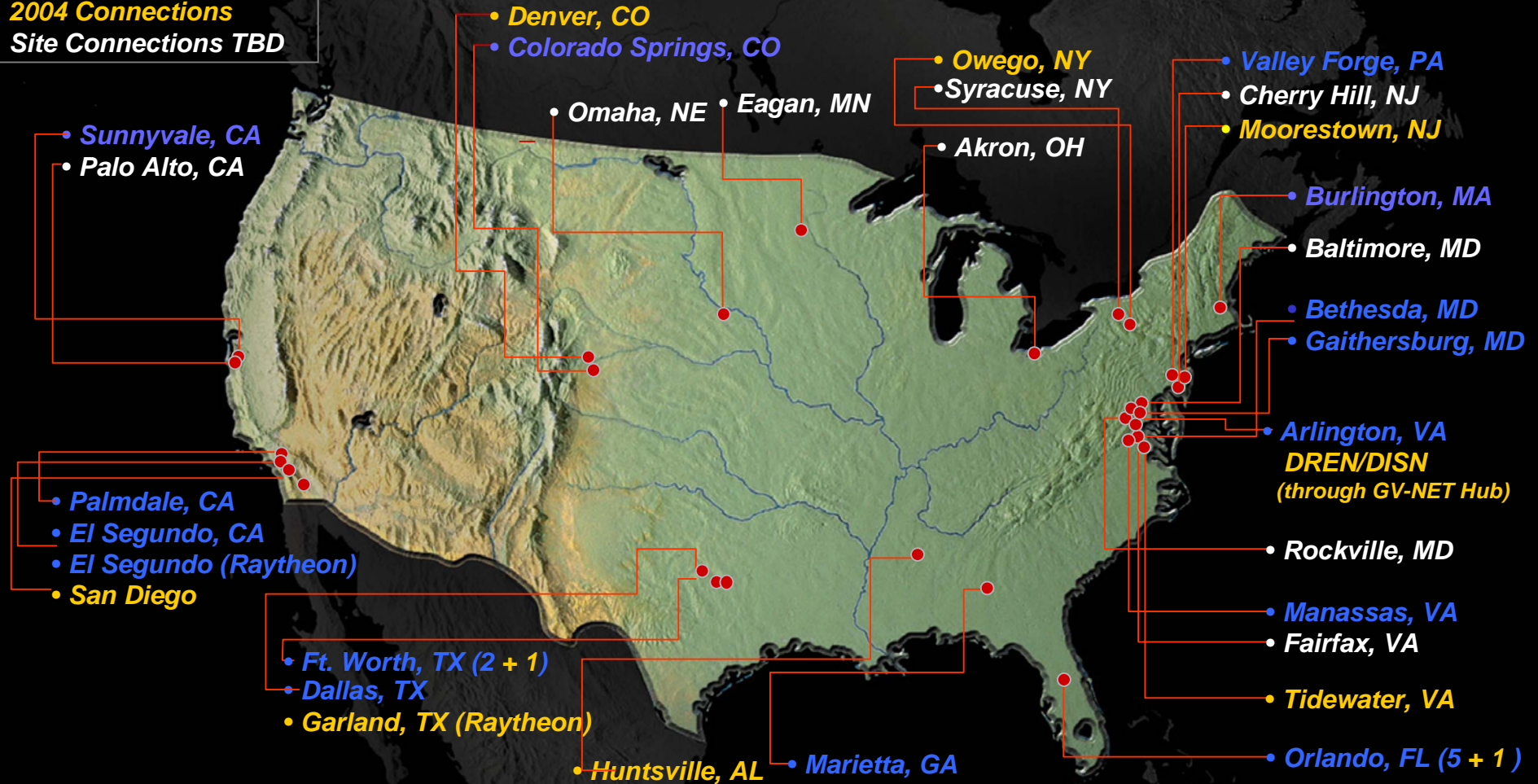
*Experimentation  
Wargaming  
Simulation  
Analyze Options*

**Collaborating with industry to provide Horizontally Integrated Solutions in a Net-Centric Environment through robust Modeling & Simulation**



# Building Network-Centric Solutions --GV-NET is the Collaborative Environment

Connected  
2004 Connections  
Site Connections TBD



**Customer Connectivity ... will be Established through  
Defense Research Engineering Network & Defense Information Systems Network**

# Conclusion



- **This is not a DoD-only issue**
- **This is not a Service-only problem – eg GCSS Family of Systems, JC2 MCPs, NCES**
- **Key issue is acquisition of architectures and infrastructure on a program by program basis!!**
  - **Why are servers/infrastructure services acquired piecemeal?**
    - **“Broken” business model – should buy hardware and core services separate from mission capability software**
    - **Separate concerns of IT infrastructure as a “cost center” from “value-add” mission capabilities**
    - **Programs do not have sufficient purview to address economies of scale on the IT infrastructure side of the equation.**

## Conclusion (Cont.)



- **Many Dimensions/Stakeholders to this issue**
  - **Cost Center view of IT and economies of scale through common licensing, support, training, CM, fielding, etc.**
  - **Unique/special performance (time dimension) and functionality requirements for mission apps/services (enterprise purpose/scope)**
  - **Different security domains**
  - **Different battlespace object naming conventions/authorities**
  - **Program constituencies within the Air Force, Services, and Congress**
  - **Joint interoperability and integration; Coalition as well**
  - **Past investment in specific architecture frameworks by these constituencies**



## Conclusion (Cont.)

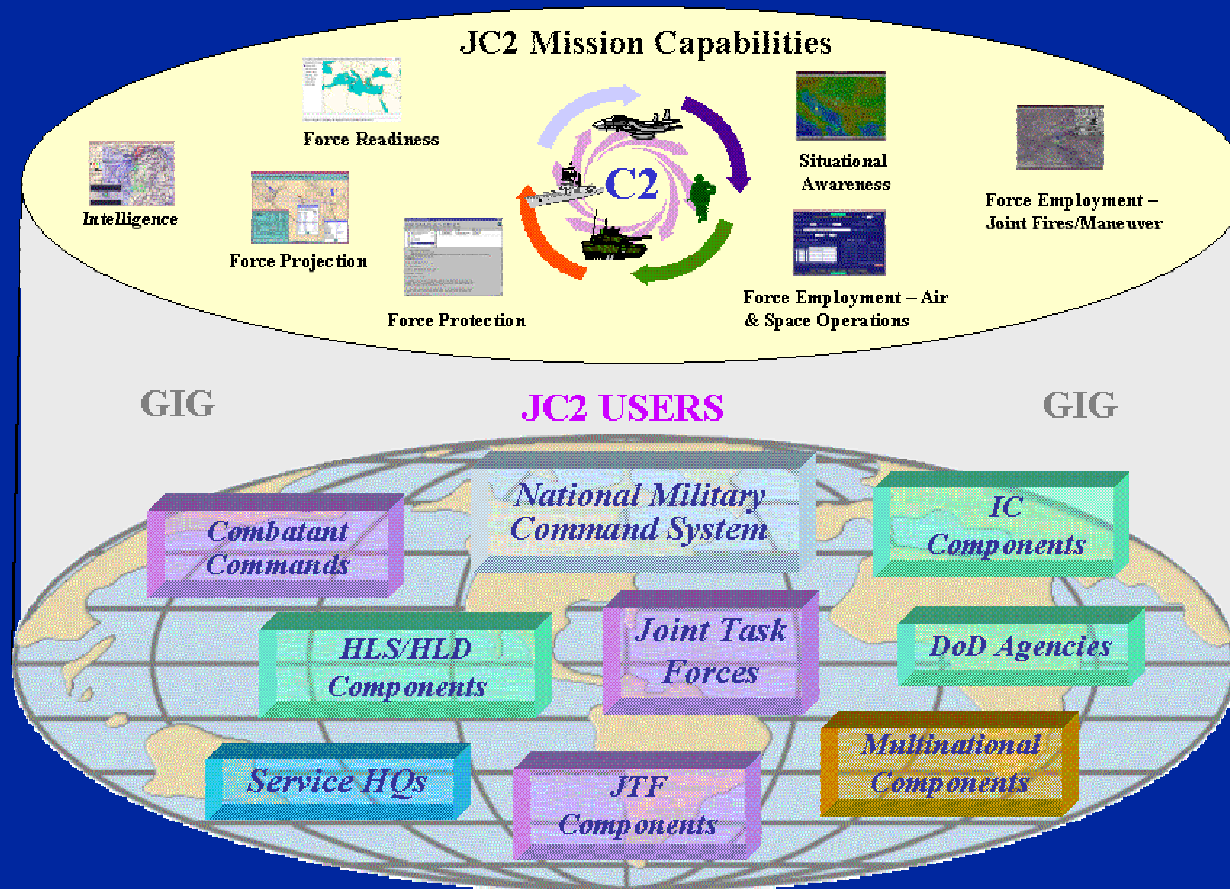


- **Different approaches are possible to satisfying all these stakeholder perspectives and all have been tried to varying degrees**
  - **Common Operating Environment dictated as acquisition requirement**
    - **Contractor responsible for acquiring COE/servers**
    - **Sometimes including application or product line architecture**
  - **Common Operating Environment furnished by the customer, across program boundaries**
  - **Operating Environment provided as network accessible services**
    - **Implies some level of servers/infrastructure is customer furnished**
    - **Current NCES direction**
  - **Contractor developed common/standard “open” architecture**

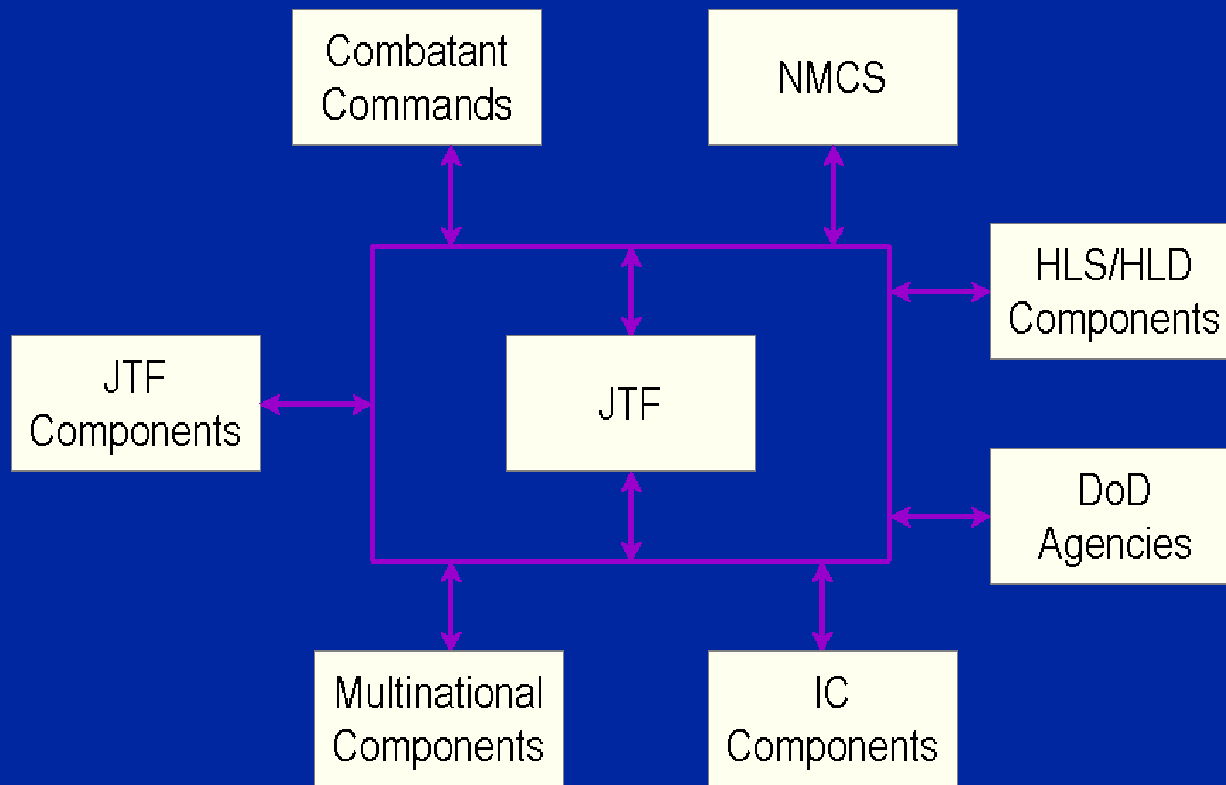


# **Backup Material for Thoughts**

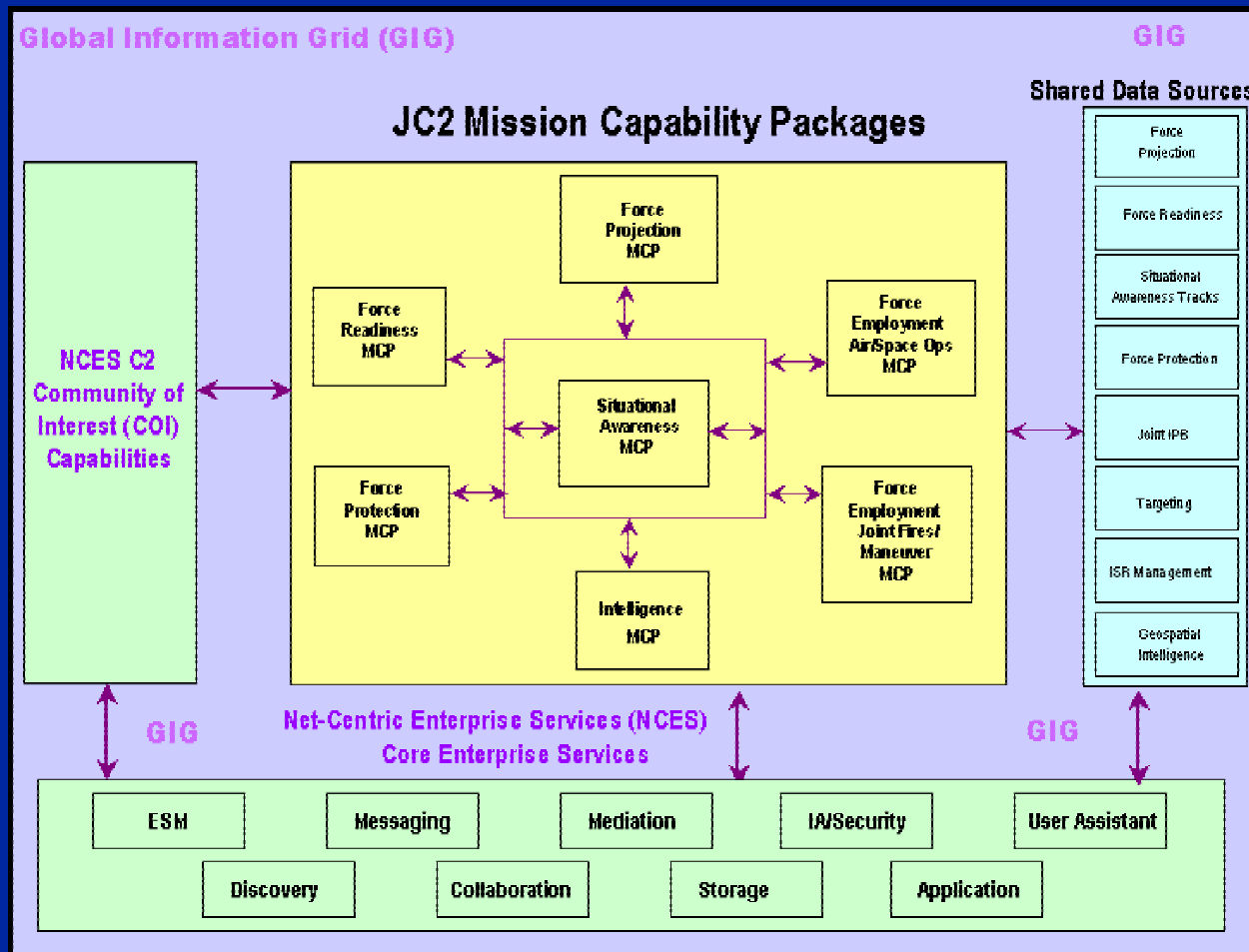
# JC2 High-Level Operational Concept (OV-1)



# JC2 Operational Node Connectivity (OV-2)



# JC2 System Interface Description (SV-1)



# Lockheed Martin Global Vision Integration Center



***Mission: Promote the development of interoperable capabilities and system-of-systems solutions across Team LM and provide an integration interface with our customers***

## ***A New Paradigm in Developing Net-Centric Systems:***

- ***Collaboration***
- ***Experimentation***
- ***Demonstration***
- ***Analysis***
- ***GV Net™***
- ***Architecture***
- ***Modeling & Simulation***
- ***Visualization***