

# *ELECTRONIC SYSTEMS CENTER*

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*Intelligence, Surveillance, Reconnaissance Systems Group*

## ***AF Distributed Common Ground System***

### **Overview of AF DCGS and DCGS Integration Backbone (DIB)**



**Col. Brian Marshall  
ISR Systems Group/KG**

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# *Topics*

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- **AF Distributed Common Ground System (DCGS)**
  - DCGS Overview
  - Our Challenge and Approach
  - Block 10.2 Modernization
- **DCGS Integration Backbone (DIB)**
  - Concept and Description
  - OSD and JROC Direction
  - Governance and Coordination
- **DCGS/JC2**
- **Take Aways**



# *What is DCGS?*

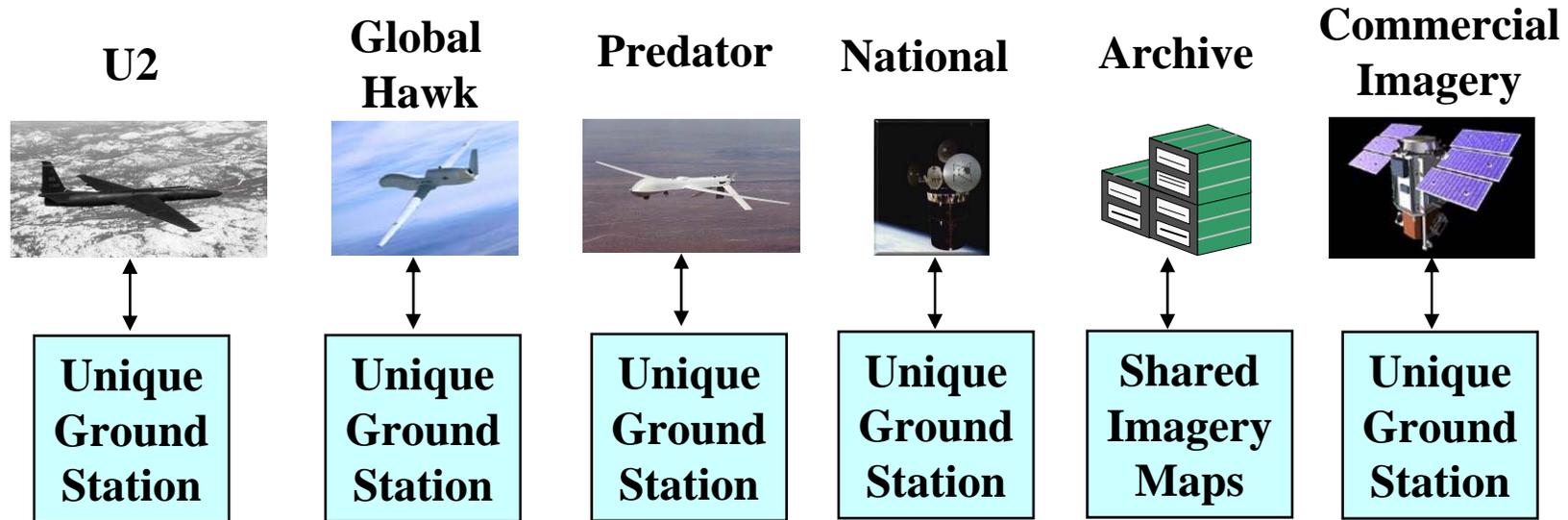
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**AF DCGS is ...**

- **An Air Force weapon system... Sentinel**
- **Global ISR capability supporting net centric warfare and in-turn information dominance**
- **The AF and DoD leader in developing/delivering net centric capability**
- **Enabled by web-based infrastructure and machine-to-machine communication**



# ***Our Challenge: Meet Changing Warfighting Needs***



**“You go into the AOC today and what do you see? You see tribal representatives sitting in front of tribal workstations interpreting tribal hieroglyphics to the rest of us who are on watch”**

General John Jumper’s Speech at the C2ISR Summit 23-25 Apr 2002



# ***What Needs to Change for Future***

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- **Flexibility to adapt system to new missions**
- **Extend capability beyond physical site and “INT” boundaries**
- **Eliminate traditional “dissemination” concepts**
  - Automate the way information is shared with customers through collaborative information grids
  - Slow information flow only to add value
- **Bring Operations and Intelligence together**
  - Collaborative foundation
  - Dynamically select the form and frequency of information
  - Dissolve boundary between the DCGS Weapon System and AOC Weapon System
- **Address Doctrine and Organization as well as Technology**



# Commercial Application A Travel Industry Example - Orbitz

Orbitz: Flight Search Results - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address http://www.orbitz.com/App/ViewFlightSearchResults?z=cfol&r=3w

Search Web Mail My Yahoo! Games Yahoo! Personals LAUNCH Sign In

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Welcome to Orbitz. [Sign in](#) | [Register now](#)

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My Search

**DEAL DETECTOR** Track fares for this trip

Non-stop	\$304 <small>see below</small>	\$304	\$304	\$304	\$700			
1 stop		\$393	\$458	\$504	\$702	\$717	\$1006	\$1771
2+ stops								

Fares are per person, using e-tickets, and include all taxes and fees. Some itineraries require paper tickets with an additional charge. Changes after purchase are subject to change fees.

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Showing: **Delta Air Lines non-stop flights** (61 flights out of 182 total) [Find more flights for Delta Air Lines](#) [See all 182 flights](#)

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**From**  
Washington, DC (DCA)  
 + airports within 70 miles

**To**  
Boston (All Locations), MA  
 + airports within 70 miles

**Leave**  
Jul 12  
Anytime

**Return**  
Jul 15  
Anytime  
 I prefer non-stop flights

**Travelers: 1**  
[Change travelers](#)

**Book it** \$304 per person

Leave	<b>Monday, Jul 12</b>	<b>Delta Air Lines 5343</b> operated by Comair	Non-stop
Depart:	7:00am	Washington, DC (DCA)	Economy   1hr 30min
Arrive:	8:30am	Boston, MA (BOS)	Canadair
Return	<b>Thursday, Jul 15</b>	<b>Delta Air Lines 5328</b> operated by Comair	Non-stop
Depart:	6:00am	Boston, MA (BOS)	Economy   1hr 30min
Arrive:	7:30am	Washington, DC (DCA)	Canadair

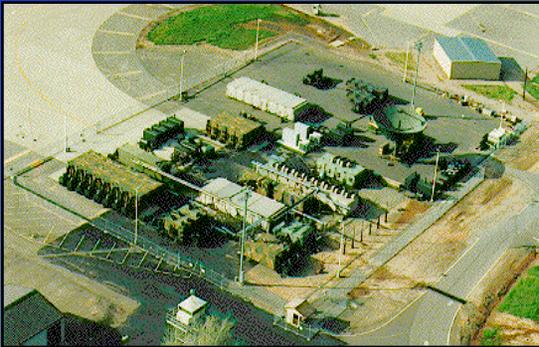
**User does not care how it works**

1. User inputs request to Orbitz service
2. Work flow manager finds and contacts airlines' reservation services
3. Each airline res. service checks availability, cost, and schedule
4. Airline services supply requested data
5. Orbitz service- captures and structures data for display
6. Consumer purchases ticket
7. In addition, other services validated your credit card & provide weather info



# AF DCGS Approach: Transform Legacy to Net-Centric

**1990s**



U2 Ground System  
Separate Processes and  
Single-INT focus

## Desert Storm and Allied Force

- Stovepipes
- Forward Deployed
- 17 C-5 loads

## OEF, OIF and GWOT

- Networked Systems
- Distributed Operations
- CONUS Reachback

## Future

- Eliminates Tribes
- Enables AF to conduct modern warfare
- Anywhere/Anytime

**Today**

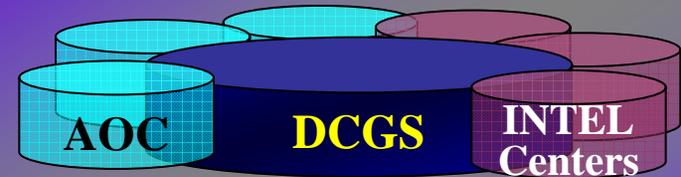
*DCGS Sites &  
Network ...*



Networked TPED Ops  
Legacy systems  
Distributed & Collaborative  
Multi-INT DCGS Nodes

**Future**

*Integrated ISR  
Network Centric*

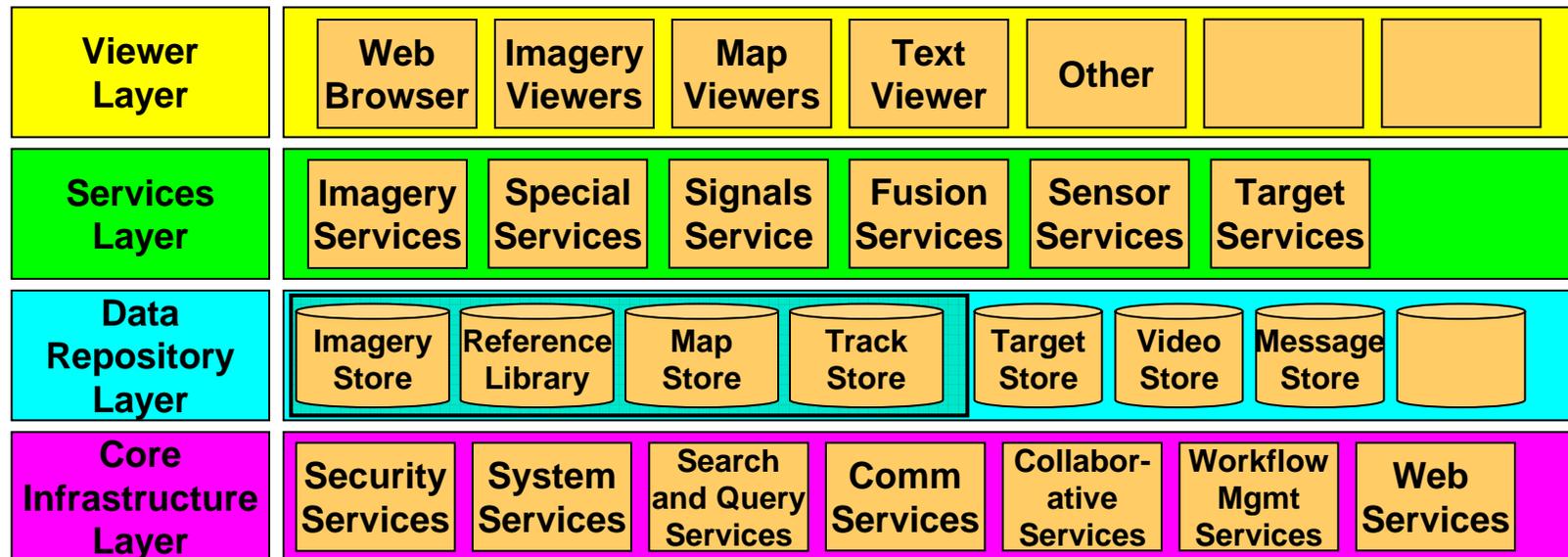


Network-Centric Warfare Ops  
Distributed and Collaborative Multi-INT  
User-focused information sharing



# AF DCGS Block 10.2: What We Did

- Followed architecture-based acquisition process using DoDAF model
- Broke apart legacy systems – proprietary stovepipes
- Applied new flexible business model
- Re-assembled into layered, net-centric, service-oriented, open system architecture
- Added core infrastructure, i.e., DCGS Integration Backbone (DIB), to tie everything together



***Take DCGS down to its foundation and rebuild***



# **AF DCGS Block 10.2**

## **Service Oriented Architecture (SOA)**

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**10.2 = DIB Components (J2EE Compliant) + Multi-INT Components & Apps**

- Web and Portal Services
- Enterprise System Services (Metadata Catalog, Publish/Subscribe, Web Alerts)
- External Tasking (Collection Mgmt & Tasking)
- Workflow Management
- Integration Support Services
- Security Services with Multiple Security Levels (Unclass-SCI)
- Collaboration Services
- COTS SW Licenses
- Multi-INT Visualization
- Softcopy Target Folders
- Distributed ISR Sensor Planning
- Distributed Imagery Screening
- Multi-INT Processing (IMINT, SIGINT, MASINT)
- Moving Target Indicator (MTI) Exploitation
- ISR Fusion
- Integrated Precision Targeting
- Integrated Joint Fires and Strike Coordination



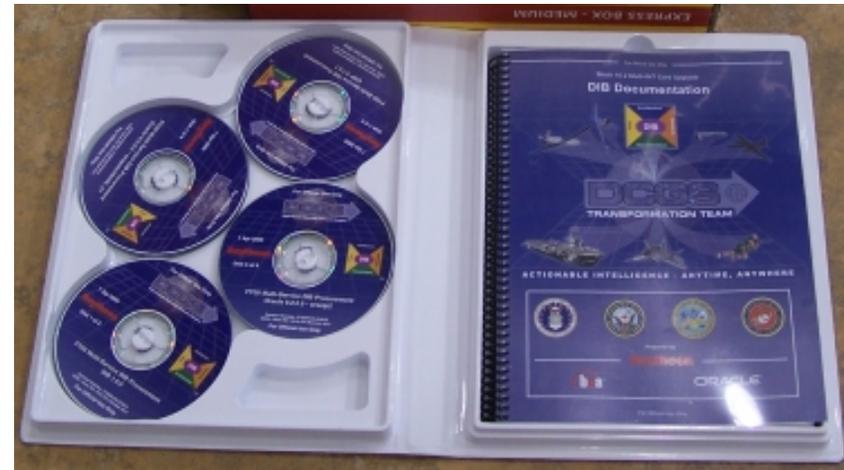
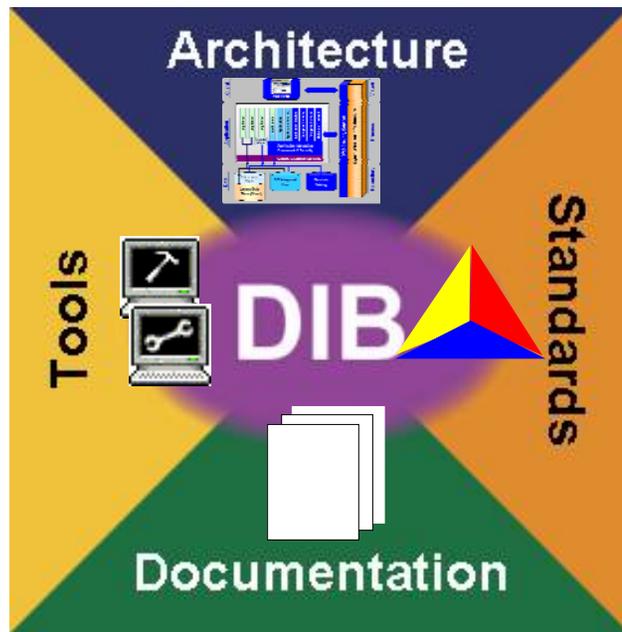
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# ***DCGS Integration Backbone (DIB)***



# What is the DIB ?

Common set of Enterprise Services and Standards  
The Foundation for Interoperability



\$6K, Typical Cost per Seat in DCGS

***DIB provides enterprise infrastructure  
Software, Architecture, Standards, Tools and Documentation***



# ***DIB was designed for DCGS***

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- **DIB Technical Requirements Document contained Net-centric infrastructure requirements**
  - Net-centric Standards and ASD/NII Guidance
  - Commercial Information Technology
- **Raytheon & Lockheed Martin designed the implementation as part of the Block 10.2 contract**
  - 90% Commercial Products: Solaris, BEA Weblogic, Oracle, HP
  - 10% Integration software
- **Compliant with OUSD-CIO and ASD-NII Net-centric mandates**
  - GIG Architecture Capstone Requirements Document
  - GIG-Enterprise (NCES) Service Standards
  - Net-Centric Operations & Warfare Reference Model (NCOW-RM)
  - Migration to NCES in DCGS Program Plan (Block 10.2 DIB TRD, 5 Feb 2004)



## ***OSD and JROC Direction***

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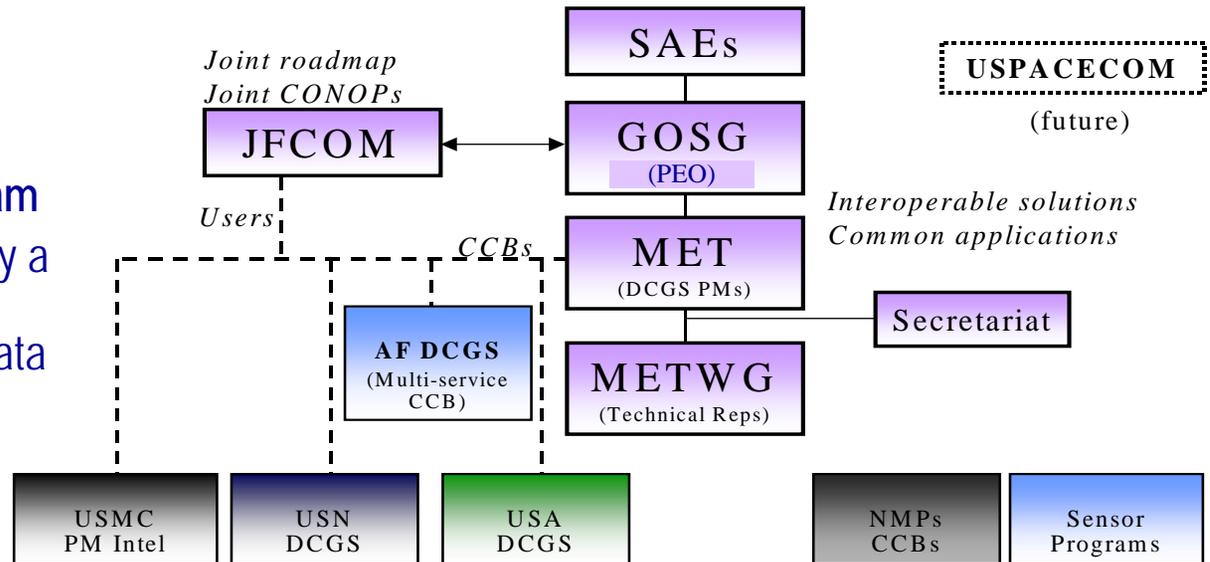
- **DCGS Acquisition Decision Memorandum (OUSD/AT&L), Oct 03, Michael W. Wynne, former Acting OUSD/AT&L**
  - Army, Navy, and Marine Corps incorporate the DIB architecture and interoperability standards
- **JROC DCGS-A ORD Memorandum, Jul 04, General Peter Pace, USMC, VCJCS**
  - Army, Navy, and Marine Corps incorporate the DIB and DIB architecture
- **AOC Acquisition Decision Memorandum (ASD/NII), Sep 05, Dr. Linton Wells II, Acting ASD/NII**
  - AOC use NCES and DIB services when available, and not develop redundant services



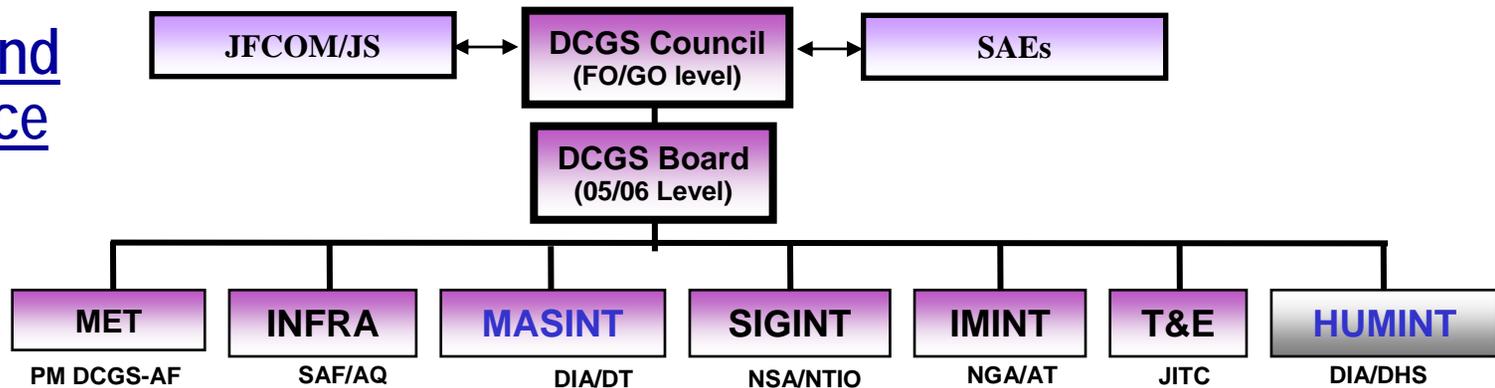
# DCGS Governance and Interagency Coordination

## Acquisition

**Multi-service Execution Team**  
 Senior level board supported by a technical working group, responsible for DIB and Metadata



## Policy and Guidance

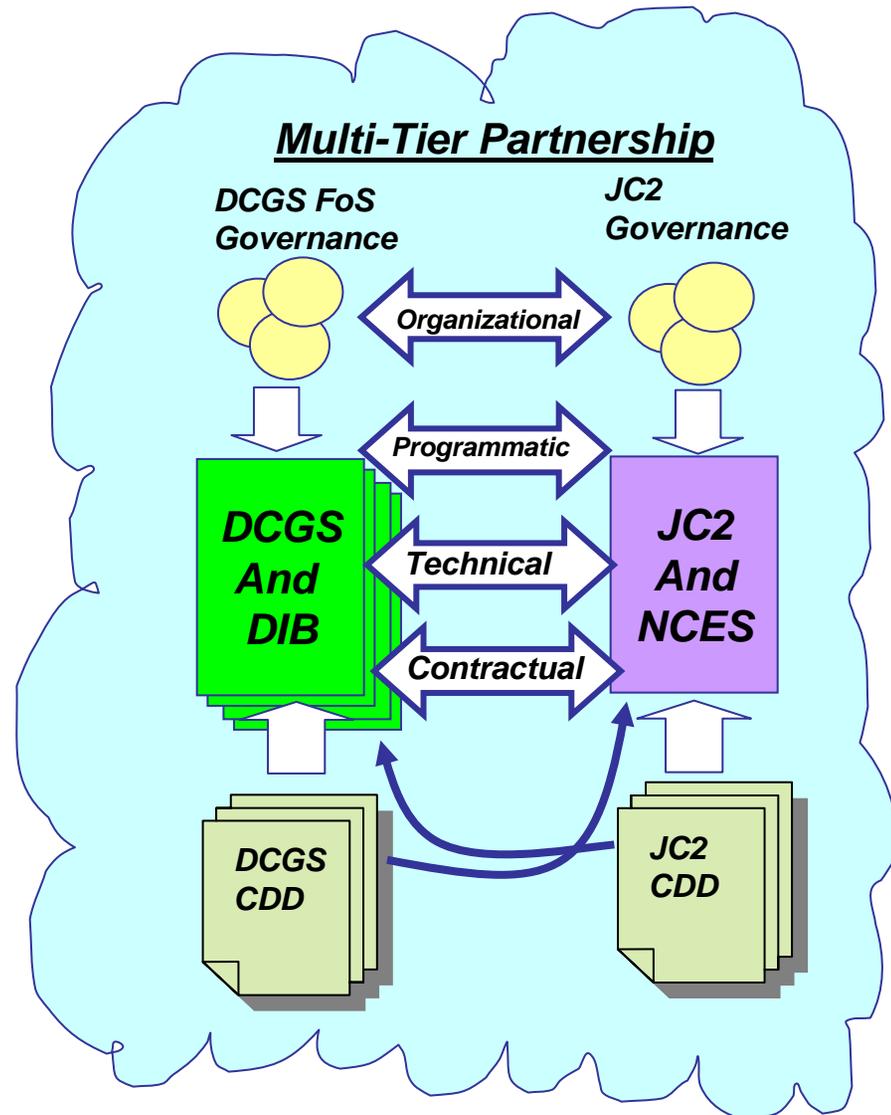


**Coordinated Multi-service Execution**



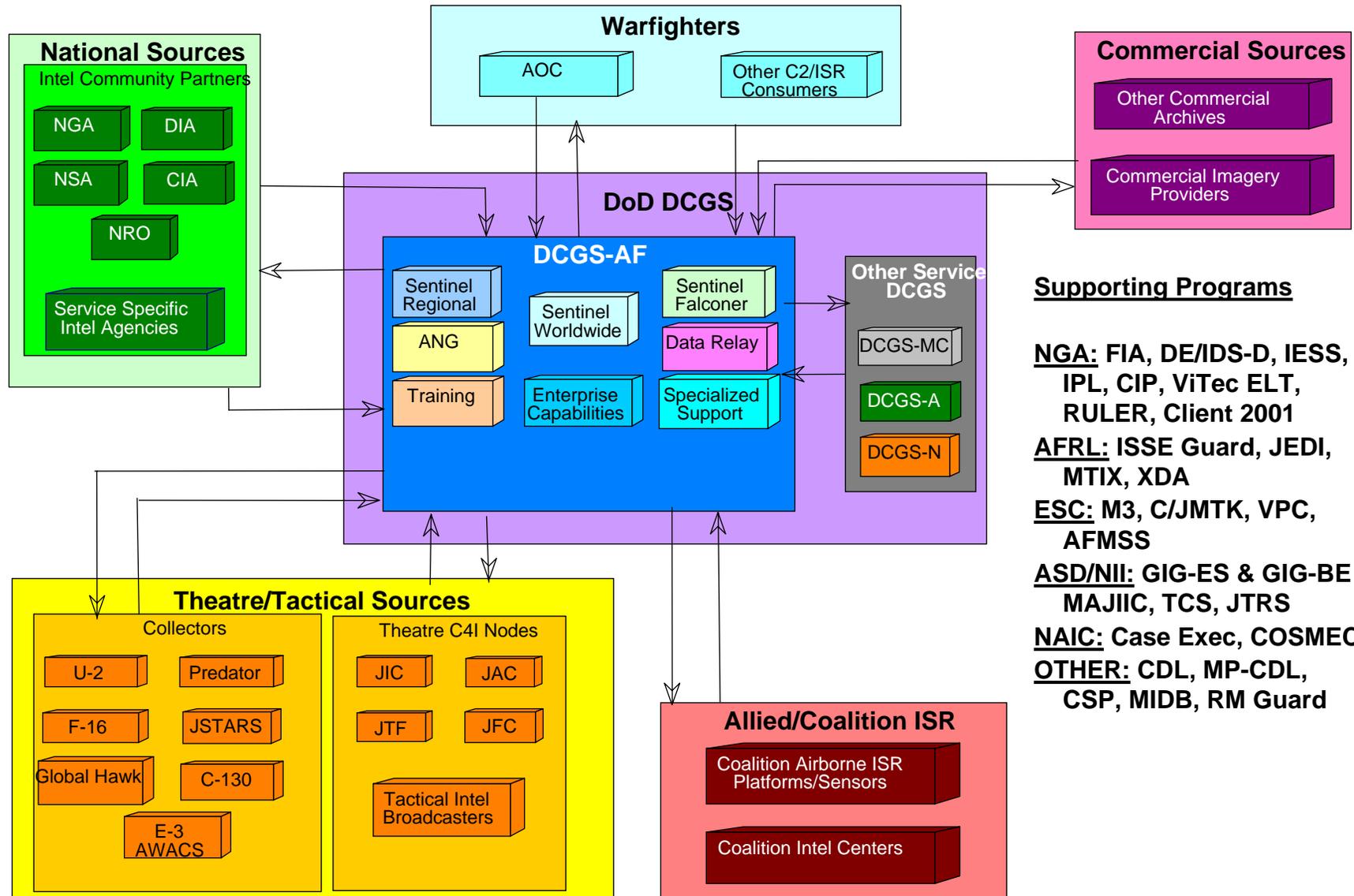
# DCGS/JC2 Integration

- **DCGS and JC2 will work integration at all levels**
  - Organizational
  - Programmatic
  - Technical
  - Contractual





# DCGS will be the ISR Focal Point for JC2



## Supporting Programs

**NGA:** FIA, DE/IDS-D, IESS, IPL, CIP, ViTec ELT, RULER, Client 2001

**AFRL:** ISSE Guard, JEDI, MTIX, XDA

**ESC:** M3, C/JMTK, VPC, AFMSS

**ASD/NII:** GIG-ES & GIG-BE MAJIIC, TCS, JTRS

**NAIC:** Case Exec, COSMEC

**OTHER:** CDL, MP-CDL, CSP, MIDB, RM Guard



# *Take Aways*

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- **AF DCGS is pioneering Net-Centric Capabilities**
  - Per OSD guidance
  - Per AF DCGS Block 10.2 DIB TRD
  - Supporting DoD DCIO Enterprise Services Roundtable  
NCES Early Adopter Working Group
- **DIB enables interoperability**
- **AF DCGS Service Oriented Architecture breaks down the “Tribes”**
  - Brings ISR to the internet model
  - Scalable architecture addresses bandwidth issues
  - Tailorable to best meet warfighter needs
- **Bottom line – DIB is migrating to NCES**

**We have broken down the ISR Tribes**



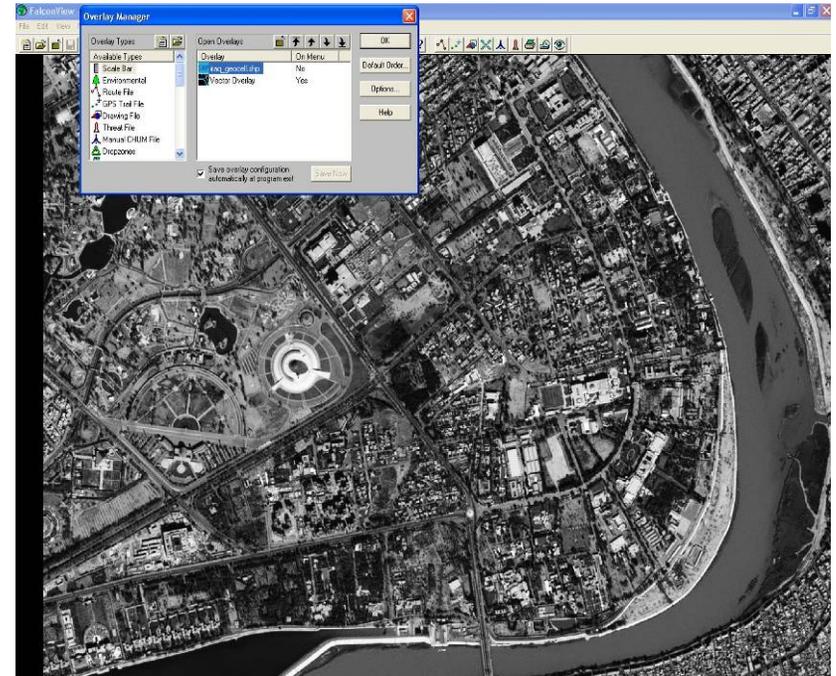
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## ***Back ups***



# AF DCGS Overview

- **Major Customers:** ACC (Lead), PACAF, USAFE, CENTAF, Air National Guard
- **Legacy systems: Daily 24/7 operations for 25 years**
- **Complex systems & interfaces**
- **Part of a larger DoD DCGS interoperable ISR enterprise**
  - Tailored DCGS capabilities fielded to meet each Service mission
- **DCGS Program Phase:**
  - **10.1 Fielded Baseline - In sustainment with ongoing combat support modifications**
  - **10.2 Block Upgrade - In development/integration**
  - **Increment 2 Upgrade – Program plan and requirements in development**





# *Early Adopters Project*

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## Participants

- **DISA NCES PMO – Co-Lead**
- **DCGS Family of Systems (FoS)**
  - Air Force – Lead and Co-Lead
  - Army
  - Navy
  - Marines
- **GeoScout (NGA)**
- **USD(I), DNI CIO, and ASD(NII)/DoD CIO**
- **CMM – Cryptologic Mission Management (NSA)**



# *Early Adopters Project*

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## Purpose

- **Deputy Chief Information Officer (DCIO) Memo Defines Mission of Early Adopters Initiatives**
  - Early Adopter Initiative to Migrate ISR COI\* to Net Centric – Enterprise Web Services
  - Concentrate on Common Security and Discovery Services
- **ISR CIO Early Adopter Initiative Goals:**
  - DISA's NCES, USD(I), DNI CIO, and ASD(NII)/DoD CIO
    - Validate and Refine NCES\* Increment 1
    - Demonstrate NCES Federated Search Enables ISR COI Programs
    - Expose Data & Services to External Users
    - Accelerate Integration of Web Services for Net-Centricity
  - Air Force DCGS
    - Reduce DCGS Integration Risk If/When NCES Is Mandated
    - Impact NCES Implementation
  - Air Force DIB
    - Improve Needed Functionality – Multi-Service Access

\*COI – Community of Interest

\*NCES – Net Centric Enterprise Services



# *Early Adopters Project*

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## Project Implementation

- **Approach to Accomplishing Mission**
  - Assist ISR COI Programs in Adopting NCES
  - Demonstrate DISA's NCES Can Support & Augment
    - ISR COI Functional Web Services
    - Enable Users to Securely Post/Discover Data Across DoD Enterprise
- **DCGS Services**
  - Multi-Service Access/Log-on Service - AF
  - Enhanced Metadata Query Service - AF
  - Enhanced External Tasking Service - AF
  - Imagery Exploitation Service - Navy
  - HUMINT Service – Army
  - SIGINT Service - Army
- **NCES services**
  - Certification Validation Service
  - Retrieve Principal Attributes Service
  - Policy Decision Service
  - Policy Administration Service



# Early Adopters Project

## Implementation Details

