

Transforming the Way the DoD Manages Data

Office of the DoD CIO

Net-Centric Data Strategy

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Net-Centricity Objectives

- Deliver capabilities-based service infrastructure for ubiquitous access to timely, secure, decision-quality information by edge users
- Enable information providers to post and share any information they hold
- Enable edge users to:
 - rapidly and precisely discover and pull information resources
 - dynamically form collaborative groups for problem solving
- Provide security for, and coordinated management of, netted information resources
- Supports transition towards Service-Oriented Architectures (SOAs) which, in turn, supports the shift towards ‘data interoperability’ versus ‘application interoperability’

Better information for better decisions

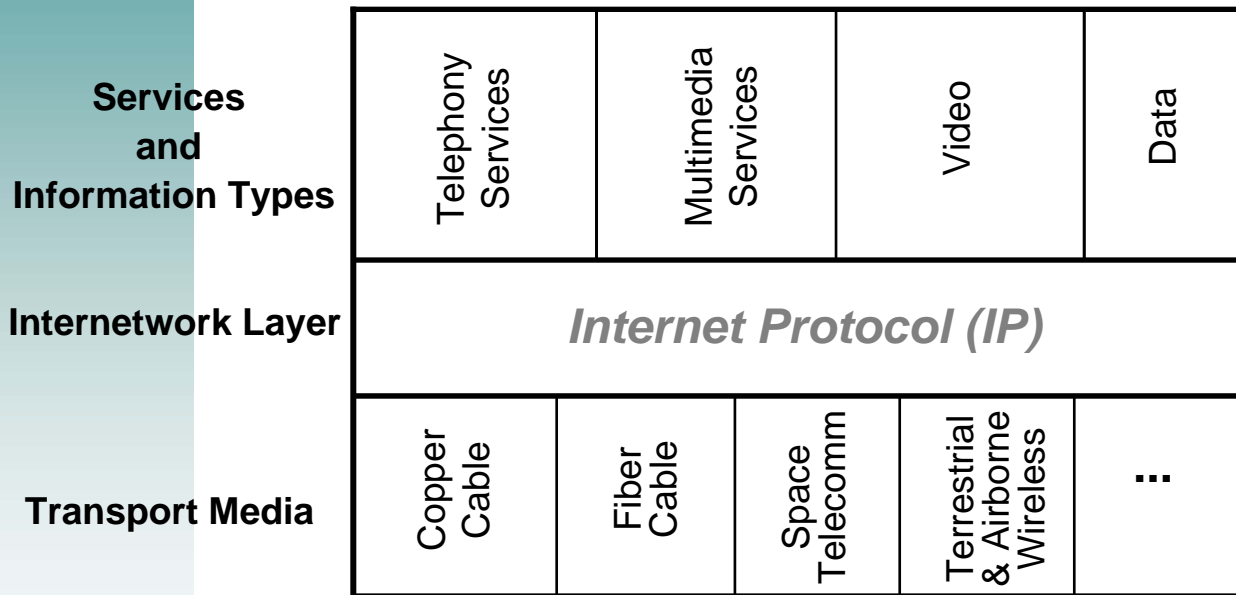


Net-Centric Attributes

- **IPv6** – IP, not point-to-point
- **Security** – IA enabled and encrypted communications
- **Dynamic allocation of access** – trusted access to net resources
- **Only handle information once** – data posted by authoritative sources and visible
- **Post in parallel** – data posted as it is created
- **Smart pull** – applications encourage data discovery
- **Data centric** – data separate from applications
- **Application diversity** – applications posted for use
- **Quality of service** – data timeliness, accuracy, completeness, ease of use



Global Information Grid: IP Based



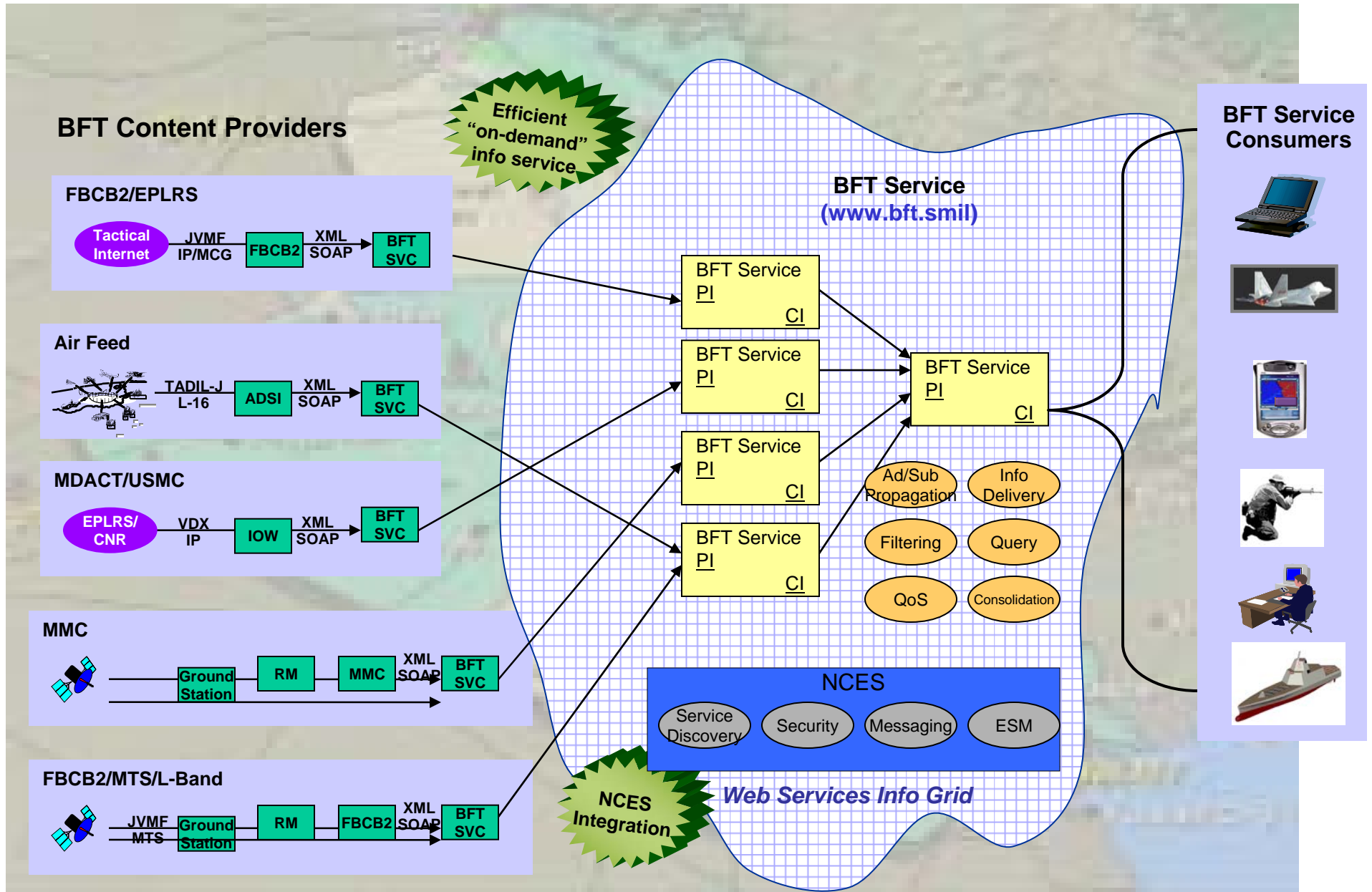
The convergence layer!

- *World-wide* acceptance and *use*
- *Packet-switched* Internet transport
- Provides *common-user*, integrated services framework
- Provides *standardized interface* between Application and Transport Services
- Used over many network-level protocols (Ethernet, ATM, WAP...)



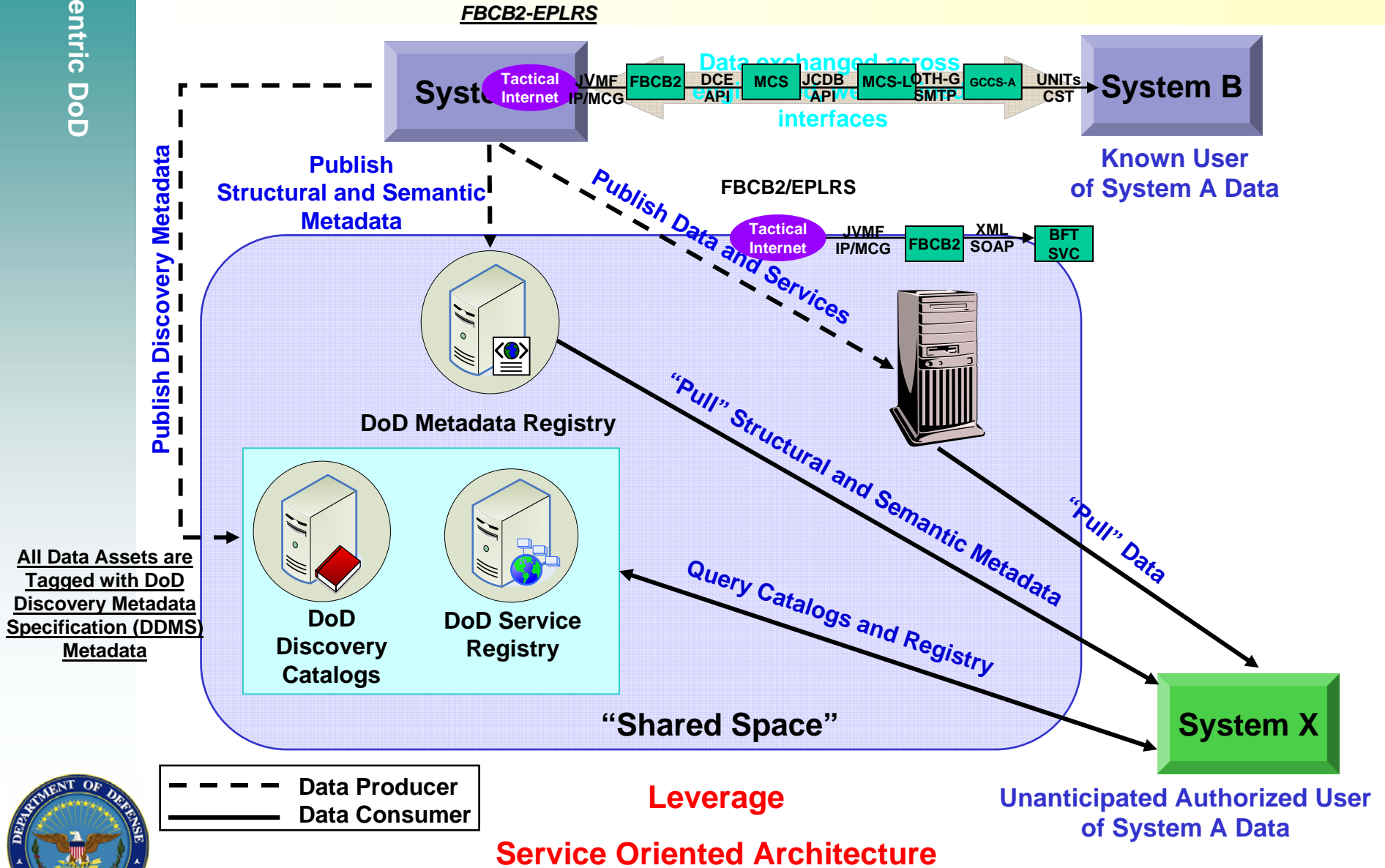
Blue Force Tracking (BFT) COI Service

An Implementation of the DoD Net-Centric Data Strategy



Publishing and Subscribing of Data & Services

Supporting Both Known and Unanticipated Authorized Users



Making Data Visible

DoD Discovery Metadata Specification (DDMS)

Data Catalog
(historical)



DDMS endorsed by Executive Order 13388
 "Further Strengthening The Sharing Of Terrorism Information To Protect Americans"

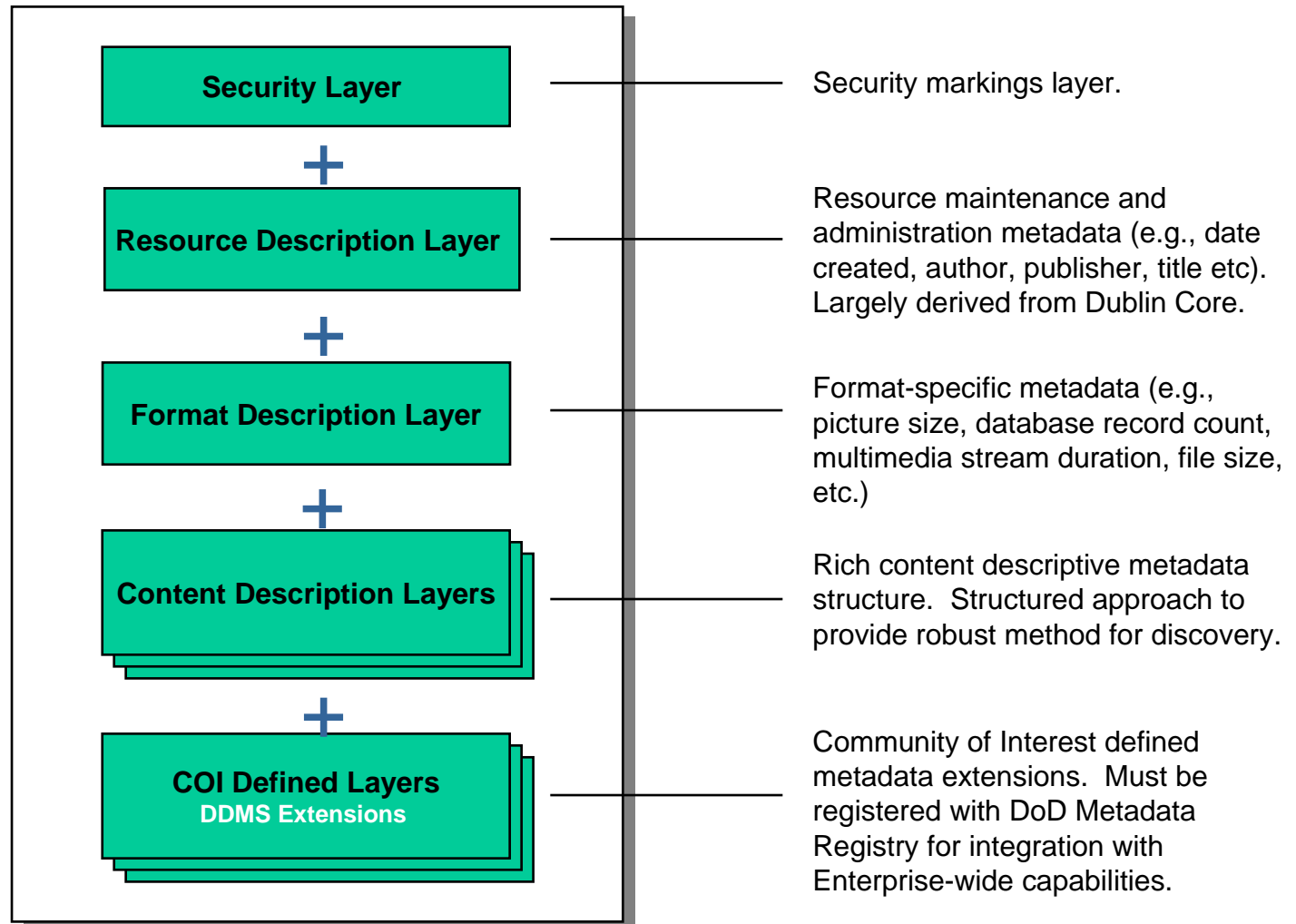
DDMS Attributes	
Security	*
Title	*
Identifier	*
Creator	*
Publisher	
Contributor	
Date	
Rights	
Language	
Type	
Source	
Subject	*
Geospatial Coverage	
Temporal Coverage	
Virtual Coverage	
Description	
Format	

* mandatory



DDMS: Leverages Industry Standard

DoD Discovery Metadata Specification (DDMS)



BFT C2 COI – Content Provider Advertisement (DDMS)

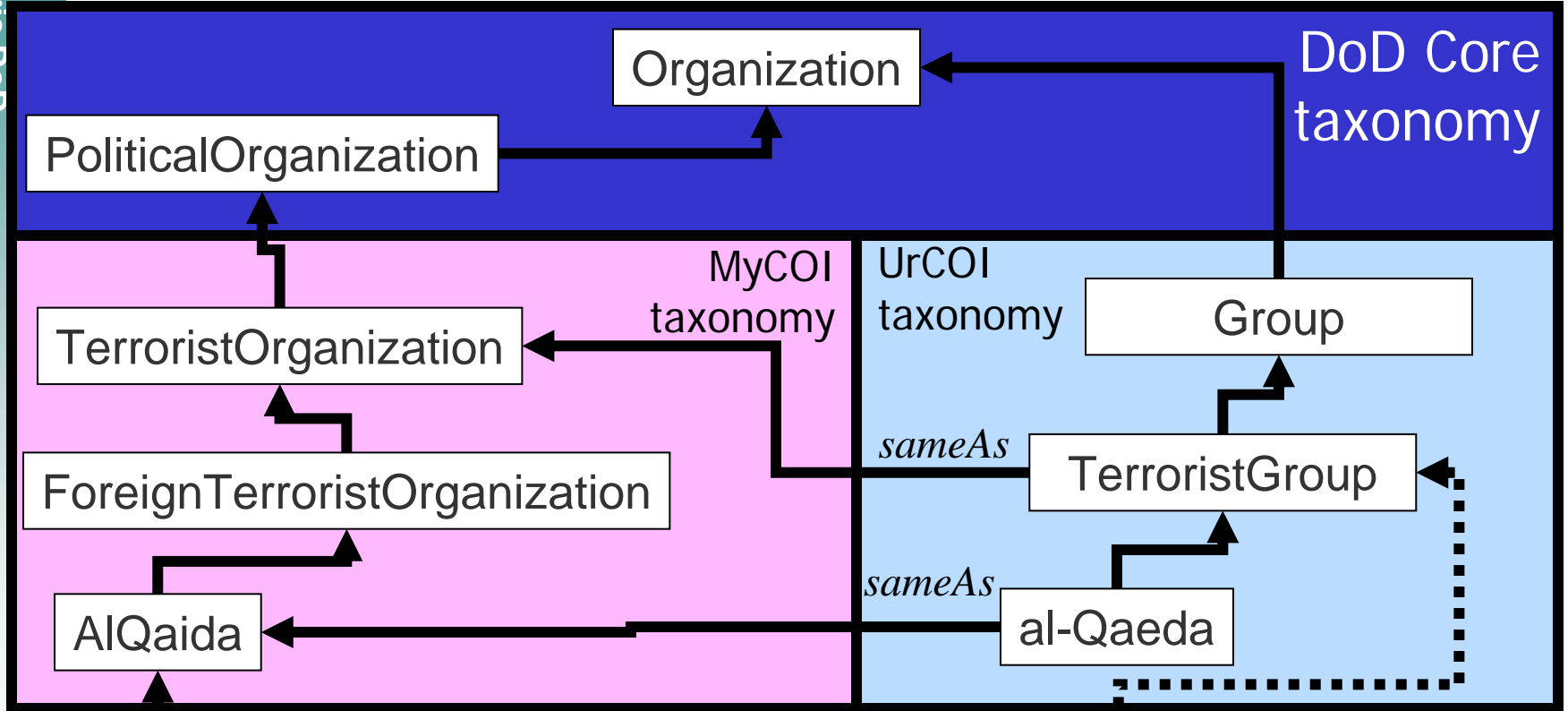
advertmeta.xml

```
<ddms:title>BFT COI</ddms:title>
- <ddms:creator>
  - <ddms:Organization>
    <ddms:name>Army</ddms:name>
    <ddms:name>3ID</ddms:name>
  </ddms:Organization>
</ddms:creator>
- <ddms:subjectCoverage>
  - <ddms:Subject>
    <ddms:category ddms:qualifier="track" ddms:code="ground" />
    <ddms:keyword ddms:value="BFT" />
  </ddms:Subject>
</ddms:subjectCoverage>
- <ddms:temporalCoverage>
  - <ddms:TimePeriod>
    <ddms:start>2004-12-17T09:30:47-05:00</ddms:start>
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  </ddms:TimePeriod>
</ddms:temporalCoverage>
- <ddms:geospatialCoverage>
  - <ddms:Place>
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    <ddms:geoRef ddms:qualifier="aoi_e_long" ddms:value="-169.0" />
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  </ddms:Place>
</ddms:geospatialCoverage>
- <ddms:protectedBy>
  - <ddms:Security>
    <ddms:classification>U</ddms:classification>
    <ddms:disseminationControls>FOUO</ddms:disseminationControls>
  </ddms:Security>
</ddms:protectedBy>
</meta_data>
</advertise>
```

BFT Content Provider Advertisements

“ Army 3rd Infantry Division
Unclassified
Ground Tracks
in
AOI1 ...”

Taxonomies to Support Discovery



```

<ddms>
:
<Subject>.../MyCOI.owl#AlQaida</Subject>
</ddms>
  
```

Producer View



Data Sharing Responsibilities

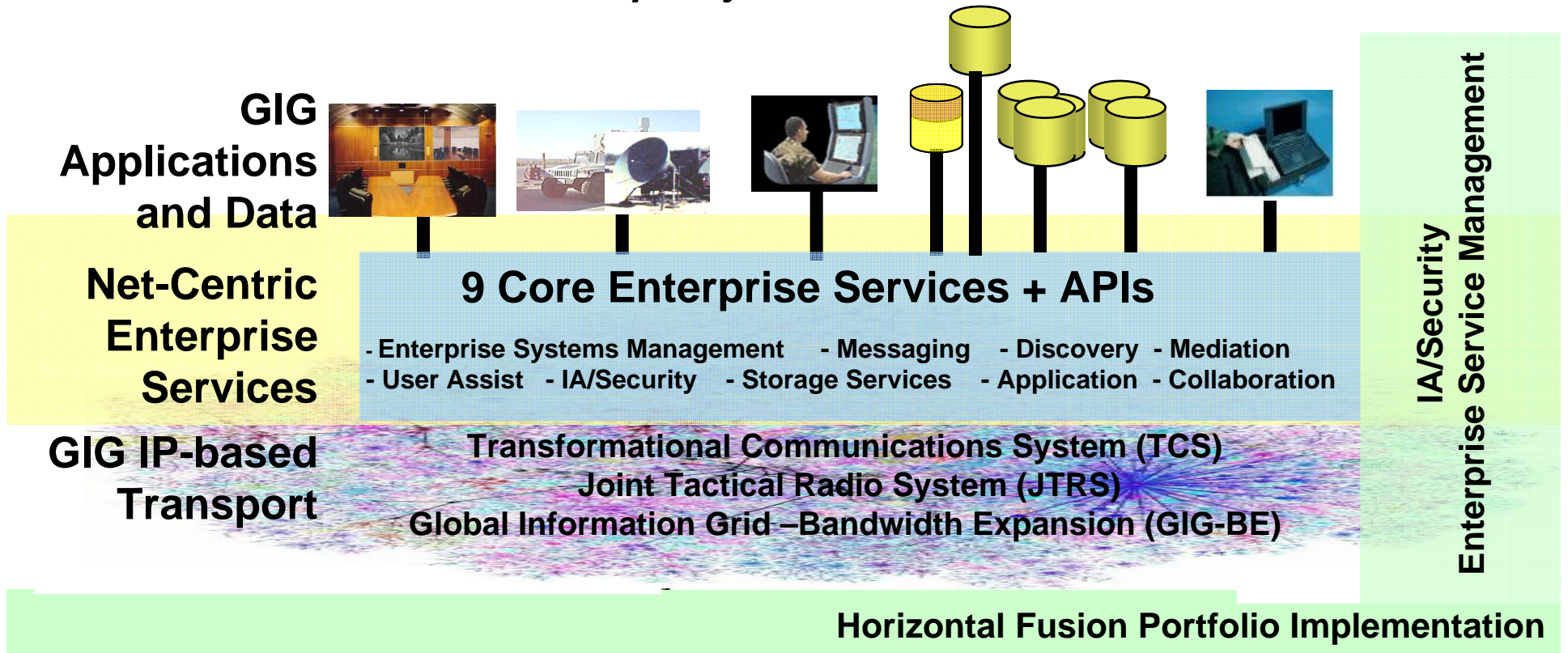
Key Goal of DoDD 8320.2	Scope of Enterprise Role	Scope of COI Role
Make data visible	<ul style="list-style-type: none"> * Develop, maintain DoD Discovery Metadata Specification (DDMS) to facilitate DoD-wide search * Direct development of Enterprise search capability 	<ul style="list-style-type: none"> * Tag data holdings with DDMS * Extend for COI specific search criteria
Make data accessible	<ul style="list-style-type: none"> * Maintain repository of acceptable commercial standards for web-based services * Direct development of federated service registry for web-services 	<ul style="list-style-type: none"> * Implement access services * Register access services in federated service registry
Make data understandable	<ul style="list-style-type: none"> * Direct development of federated metadata registry for semantic and structural metadata 	<ul style="list-style-type: none"> * Develop vocabularies, taxonomies for data exchange * Register these agreements in federated DoD metadata Registry



Net-Centric Enterprise Services (NCES)

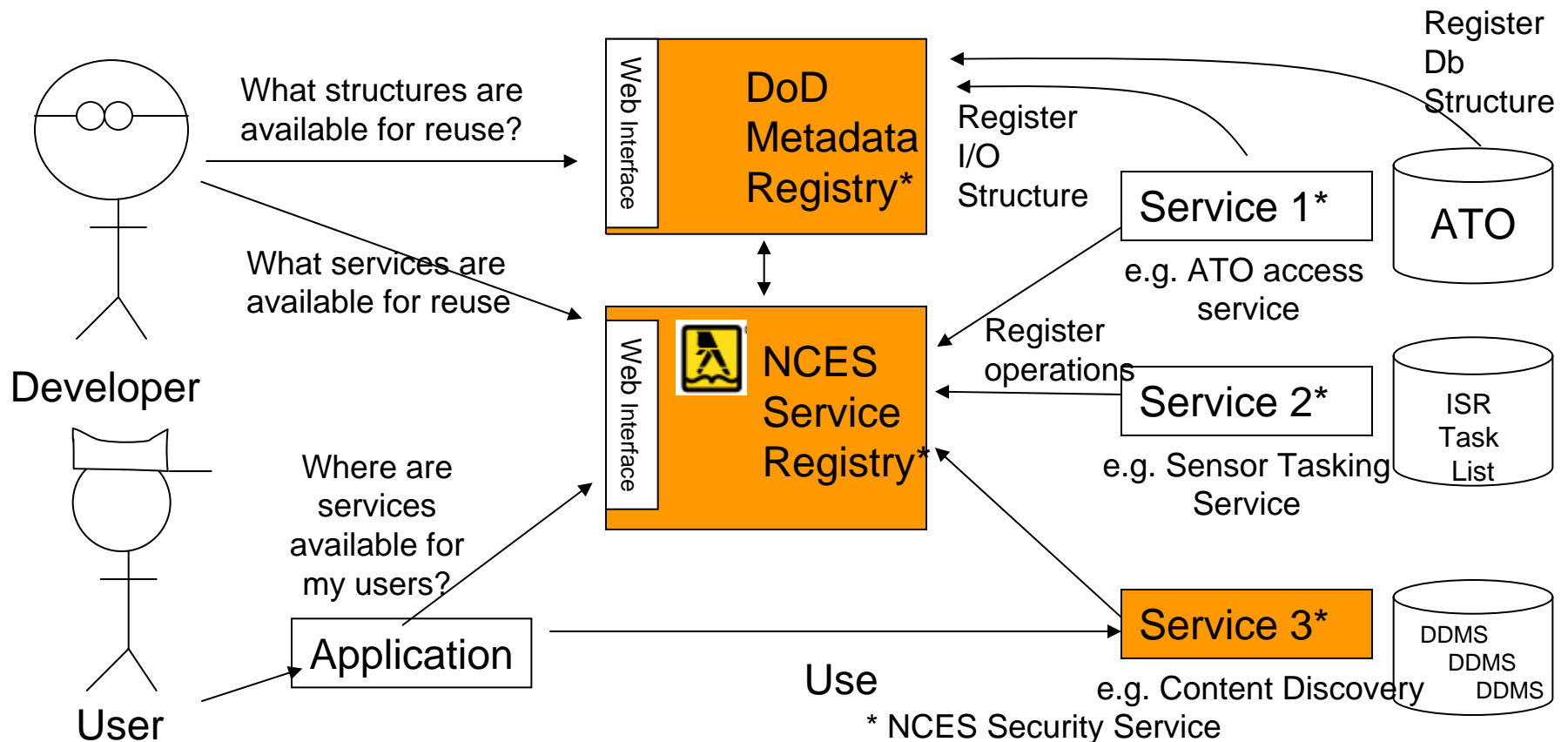
Part of the Global Information Grid

Net-Centric Enterprise Services (NCES) provide a common set of information capabilities for timely, secure, ubiquitous edge user access to decision-quality information within the GIG.



NCES Enabler: SOA Foundation

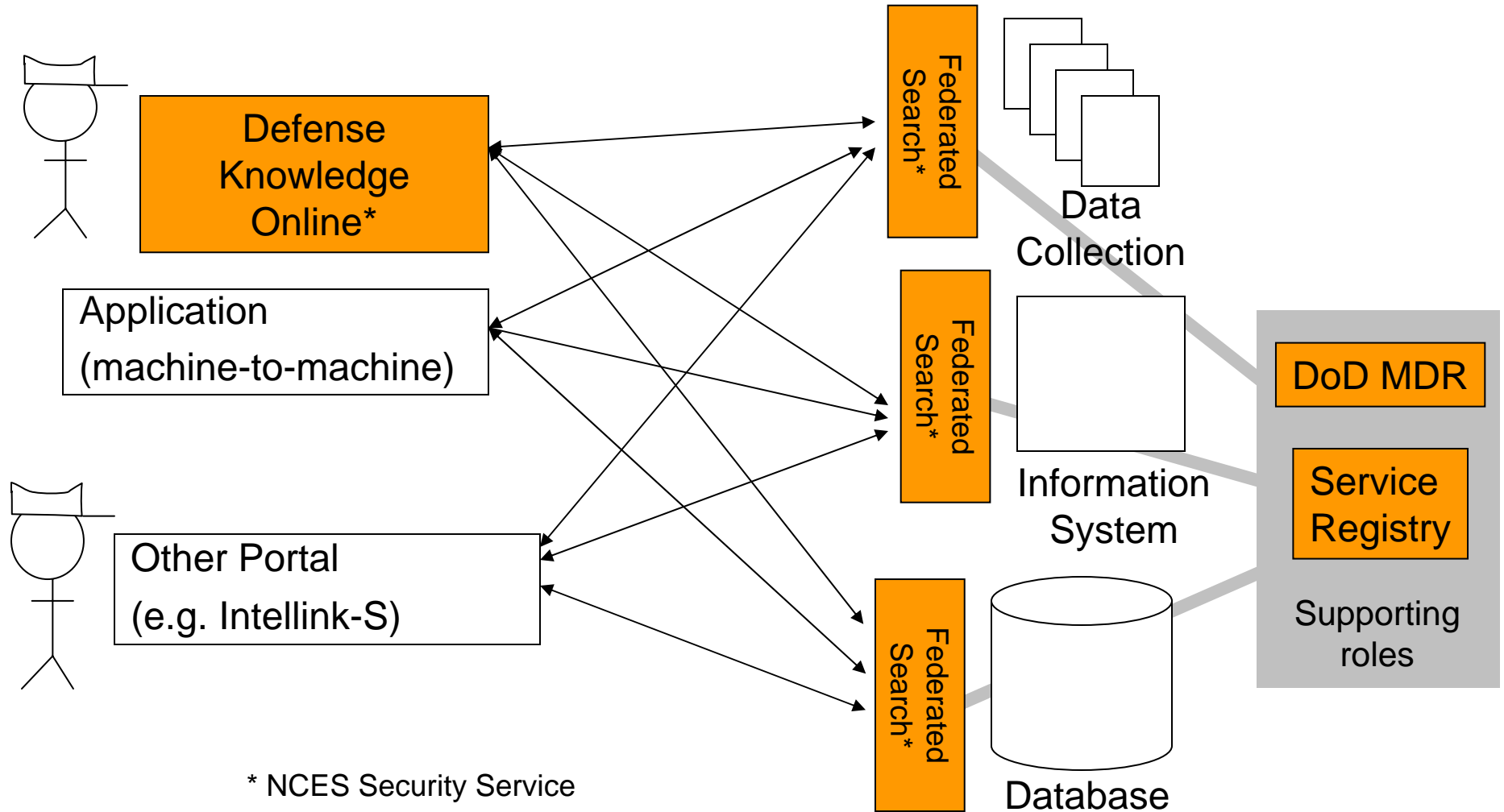
1. Register structural metadata
2. Develop & register web services
3. Develop applications



Warfighter, Intelligence, & Business User benefit *indirectly*

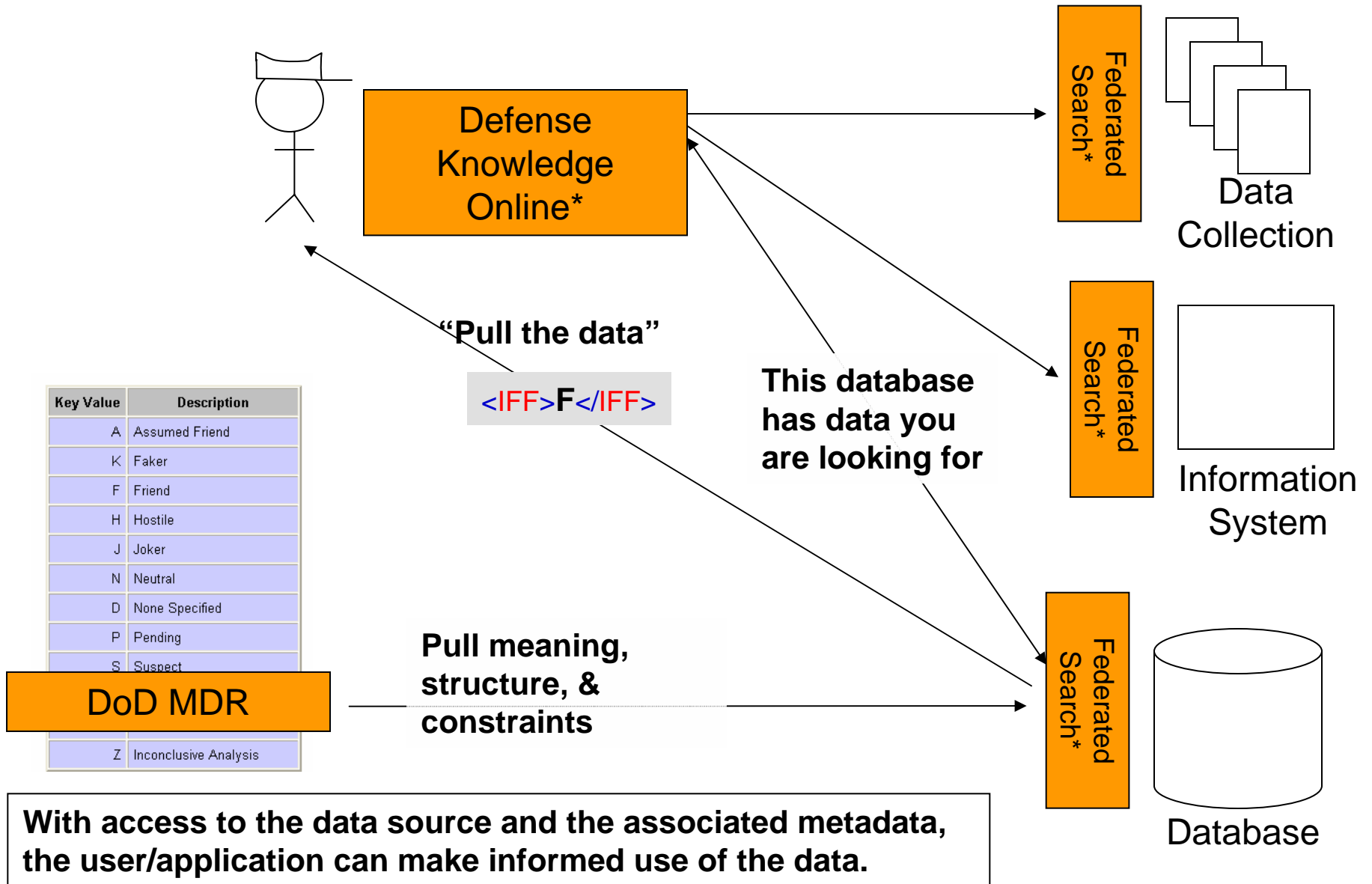
NCES Enabler: Content Discovery

Search Web Service enables federated content searches



Defense Knowledge Online is one way to use Content Discovery

Using Discovered Content



Local Chain-of-Command Implementation Decisions

- Who
 - Authors – potentially everyone
 - Publishes – *Chain of Command policy and case-by-case decisions*
 - Catalogs – publishers*: innovative techniques required
- What
 - Is Published – *Chain of Command policy and case-by-case decisions*
 - Is Cataloged – everything that's published. NII Guidance: "Visibility - Tagging and Advertising Data Assets with Discovery Metadata"
- When
 - Is it Published – *Chain of Command policy and case-by-case decisions*
– *but at the earliest possible time after created/acquired with rapid follow up*
 - Is it Cataloged – Upon publishing
- Where
 - Is it Published – widely shared network spaces (intranet, internet)
 - Is it Cataloged – at the source
- How
 - Is it Published – limited & unlimited access; documents & services
 - Is it Cataloged
 - Documents: Automated & semi-automated tools for populating Data Catalogs
 - Services: Service Registry (basic service description) and DoD Metadata Registry (structural metadata)



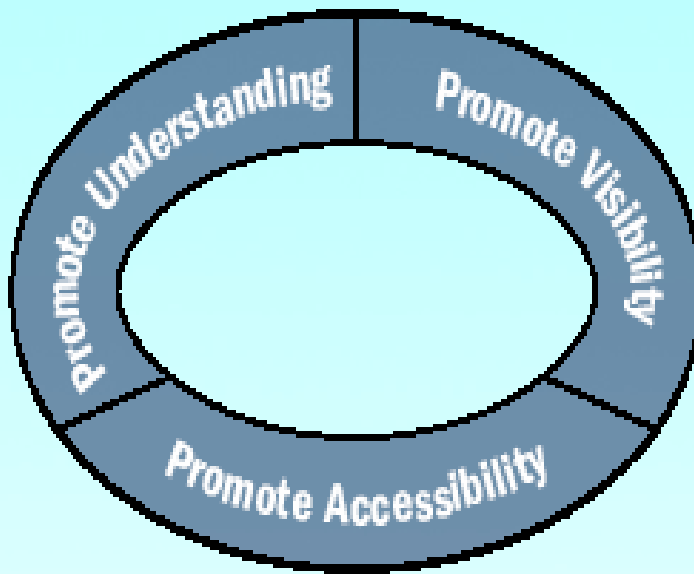
COI Overview

Deputy CIO Proposed Activities for COIs to Implement

Key Activities

1. Identify/establish COI
2. Identify membership and governance (e.g. Mission Areas, Domains) and key stakeholders (e.g. Programs, Operators)
3. Identify/prioritize/select key COI capabilities and data assets to expose to Enterprise
4. Register into DoD COI Directory (<https://gesportal.dod.mil/sites/coidirectory>)
5. Define and register COI structural metadata (e.g. taxonomy, vocabulary, data models, schema)
6. Define discovery metadata and process (extend the DDMS)
7. Tag data assets and post to searchable catalogs (e.g. Domain metadata catalog and service registry)
8. Register COI services (supports separation of data from applications)
9. Operate and sustain COI services (e.g. web services) for selected COI capabilities (leverage NCES CES)

COI Framework and Activities



These three major COI activity areas comprise a framework to meet the goals of the Net-Centric Data Strategy



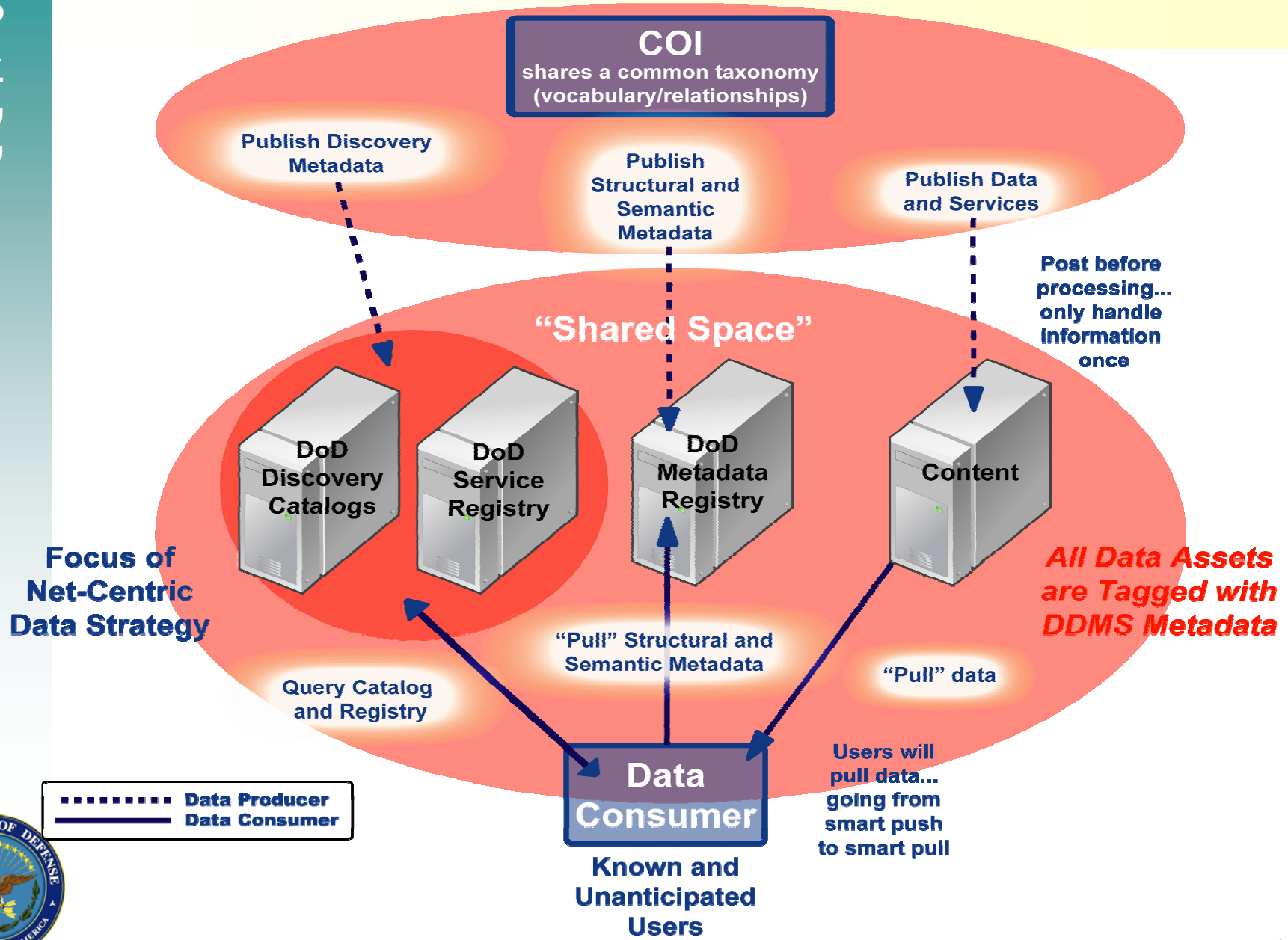
Technology view of what does a COI do?

- Make their data assets visible and accessible
 - Visible via service registry (WSDL), metadata registry (XSD), and data catalogs (DDMS)
 - Accessible via web services and common mime types
- Define COI-specific vocabularies and taxonomies
 - Vocabularies to improve data exchange within COI and among COIs
 - Taxonomies to improve precision discovery
- Register semantic and structural metadata to the DoD Metadata Registry (<http://metadata.dod.mil>)
 - XML Gallery for XML schemas, stylesheets, domain sets, samples
 - Taxonomy Gallery for discovery taxonomies (OWL syntax)

http://www.defenselink.mil/nii/org/cio/doc/COI_FAQ.doc



COIs Implementing the Data Strategy



COP vs UDOP

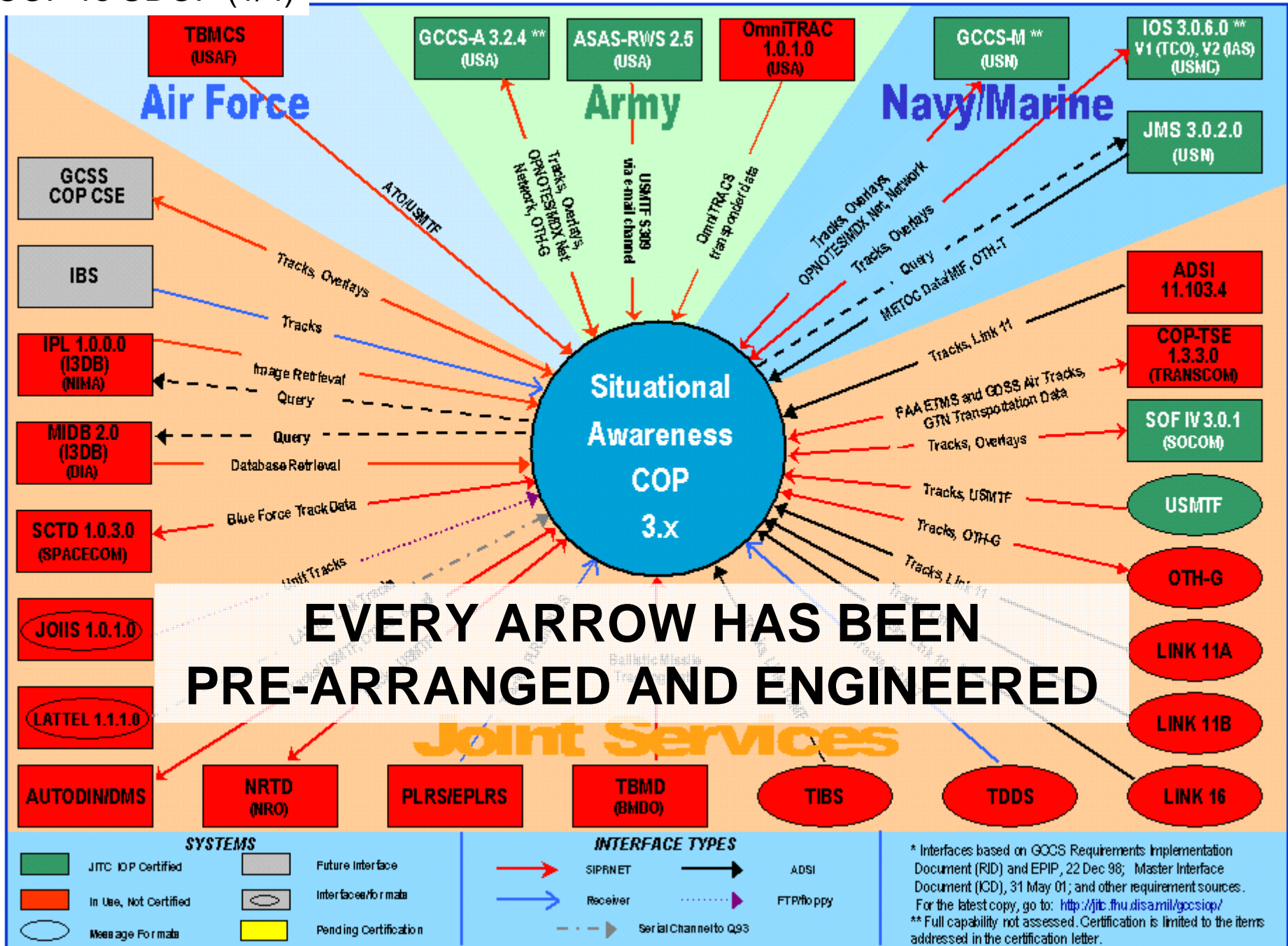
- COP = Common Operational Picture
- UDOP = User-Defined Operational Picture
- A COP is a visual representation of a common database shared by some community
 - The information available is limited to pre-arranged data sources
- A UDOP is a visual representation of data sources *which are available in common to the community*
 - The information available is not pre-determined



COP vs UDOP (1/4)

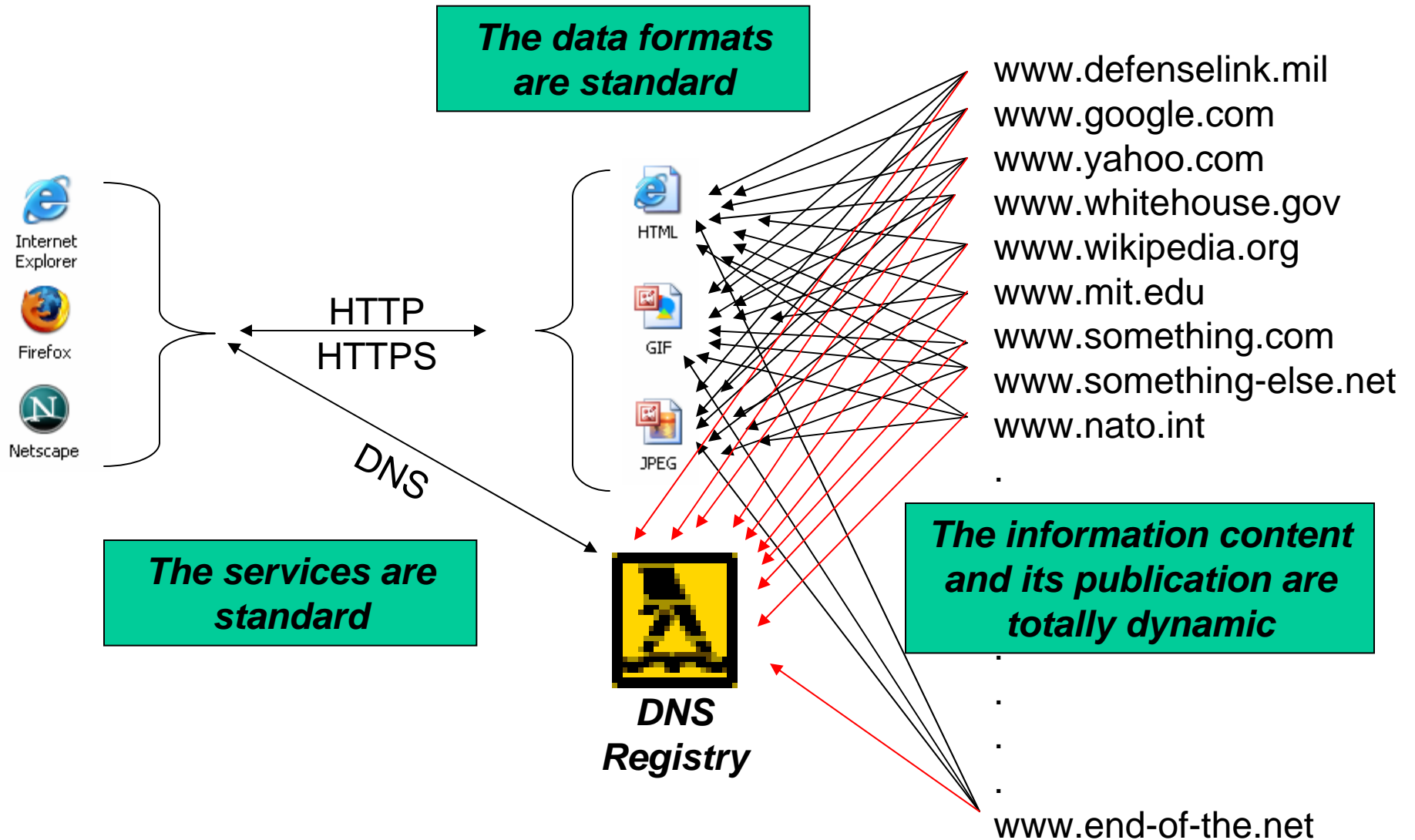
COP EXTERNAL INTERFACES

As of 1/7/02

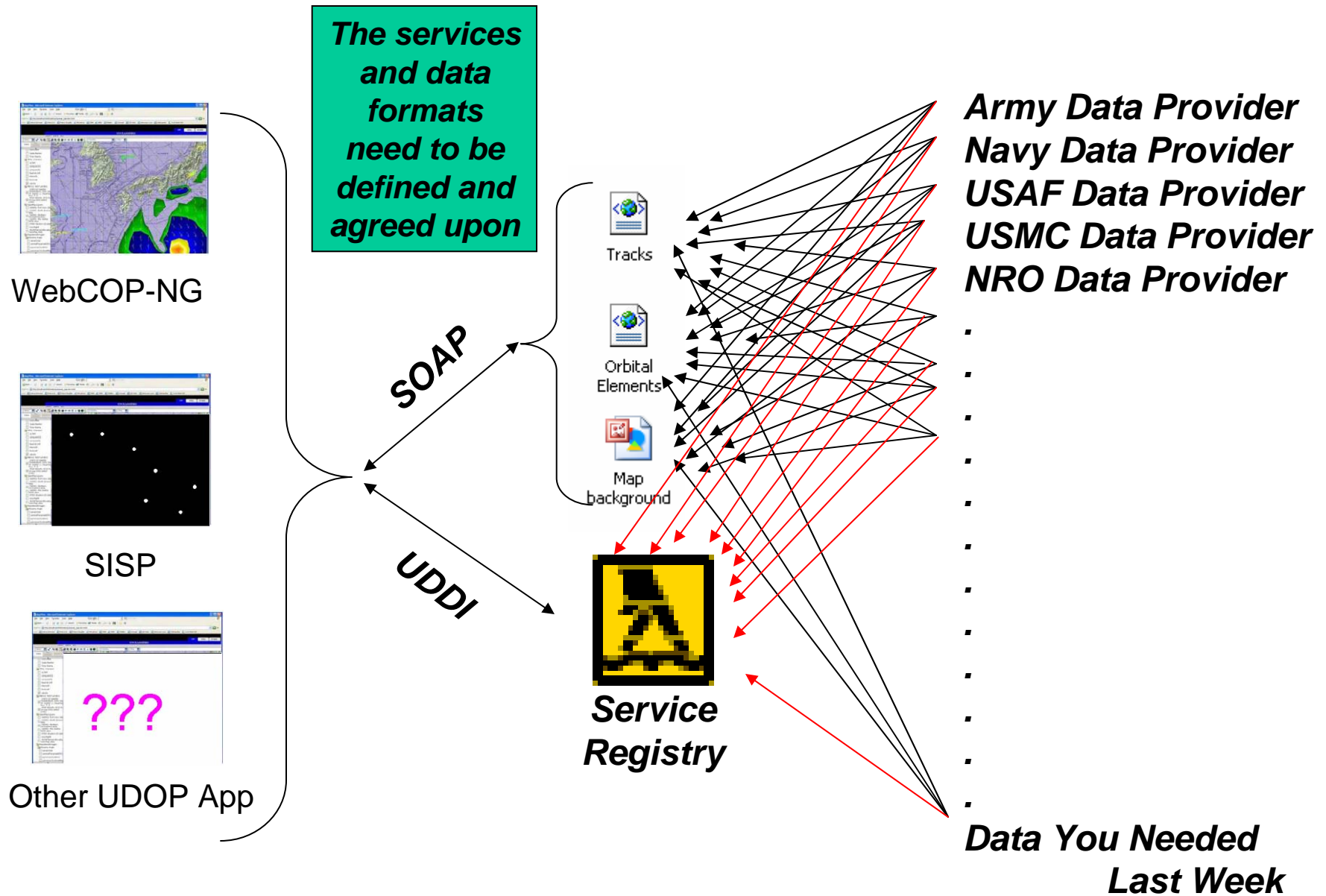


Web Browser Interfaces

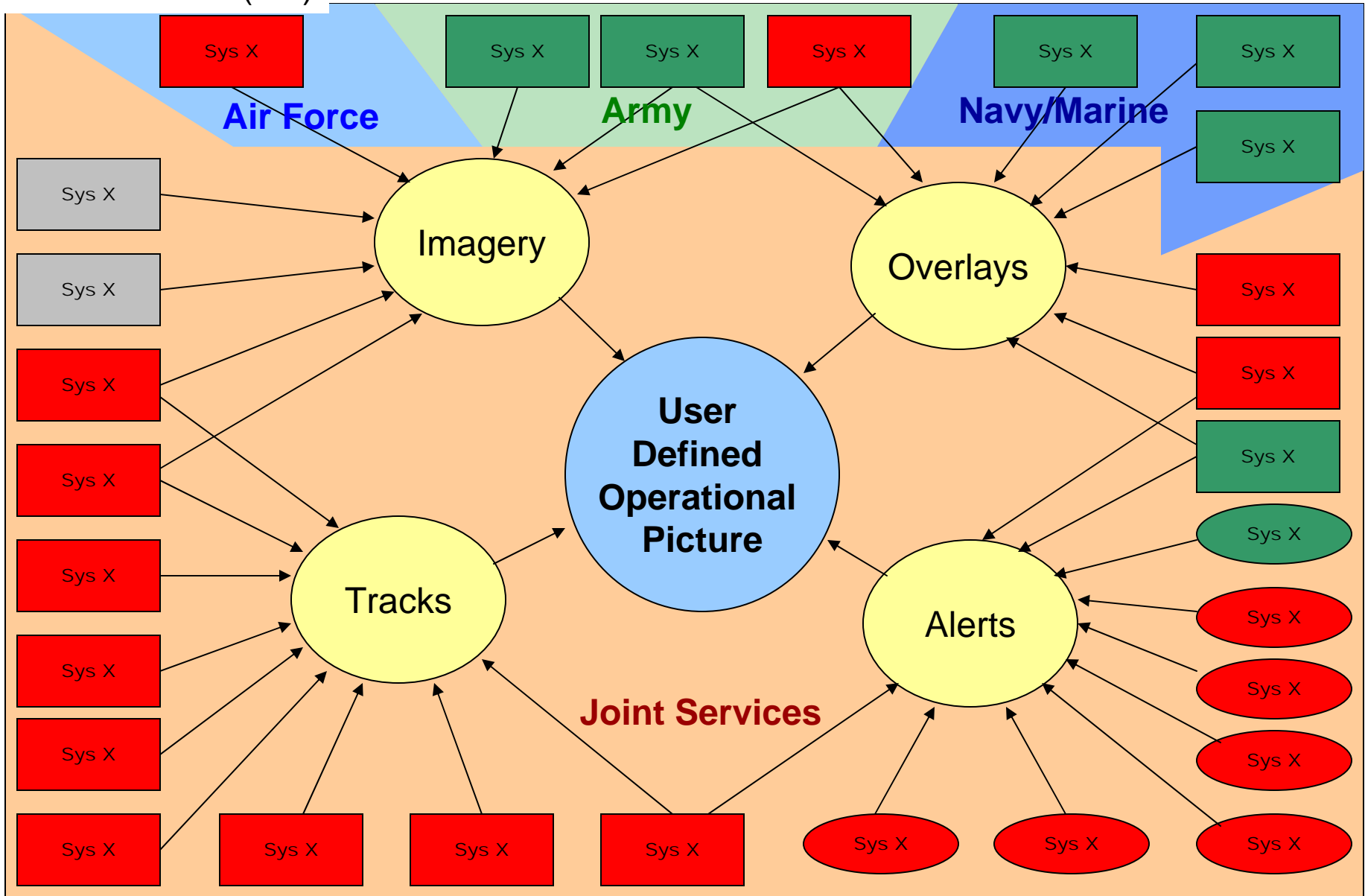
a counter-example



UDOP Interfaces



COP vs UDOP (4/4)



Data providers publish to the GIG in standard formats
Users select what they want on their UDOP

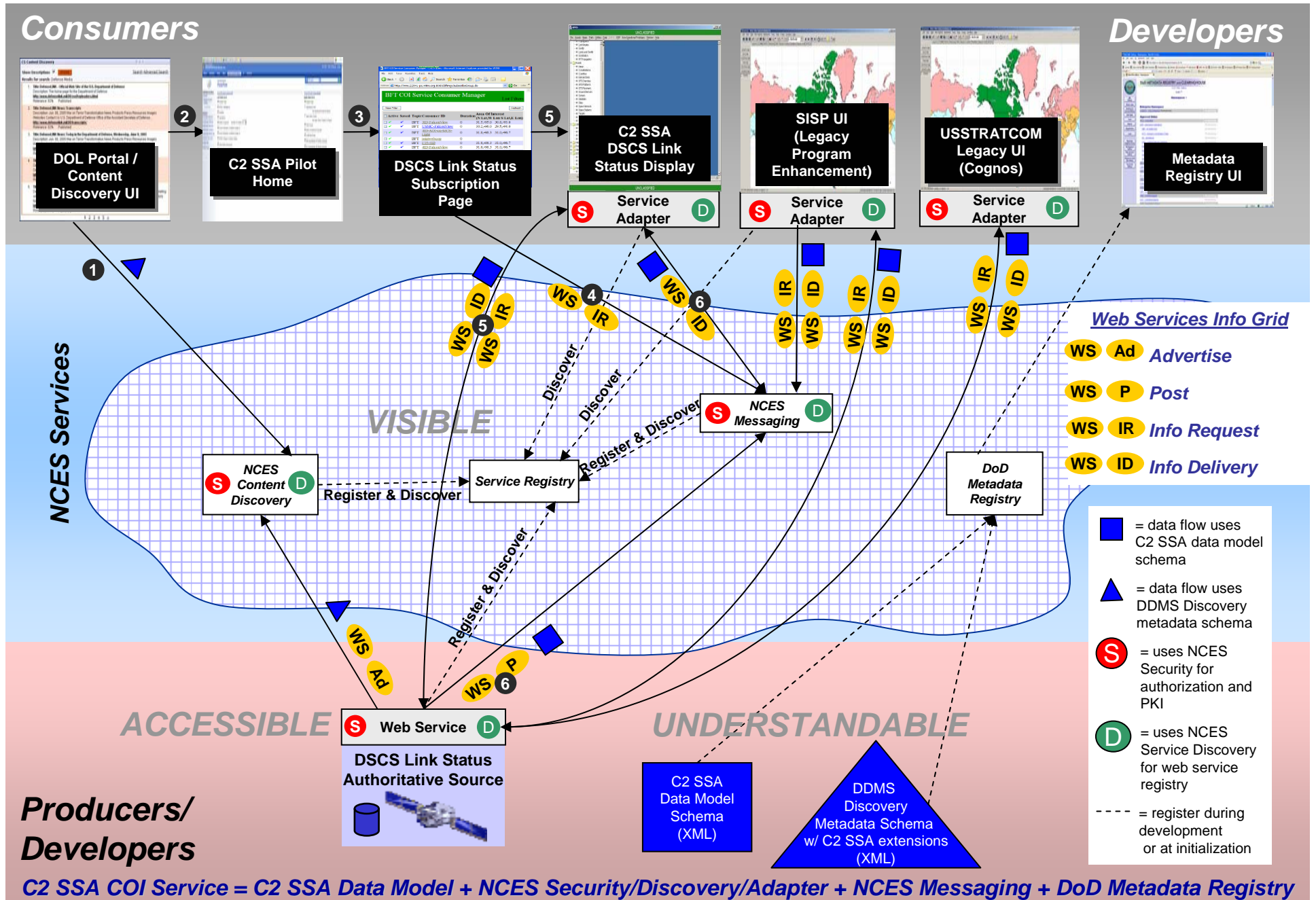


Google Earth and the Keyhole Markup Language provide an example of what a UDOP might be like

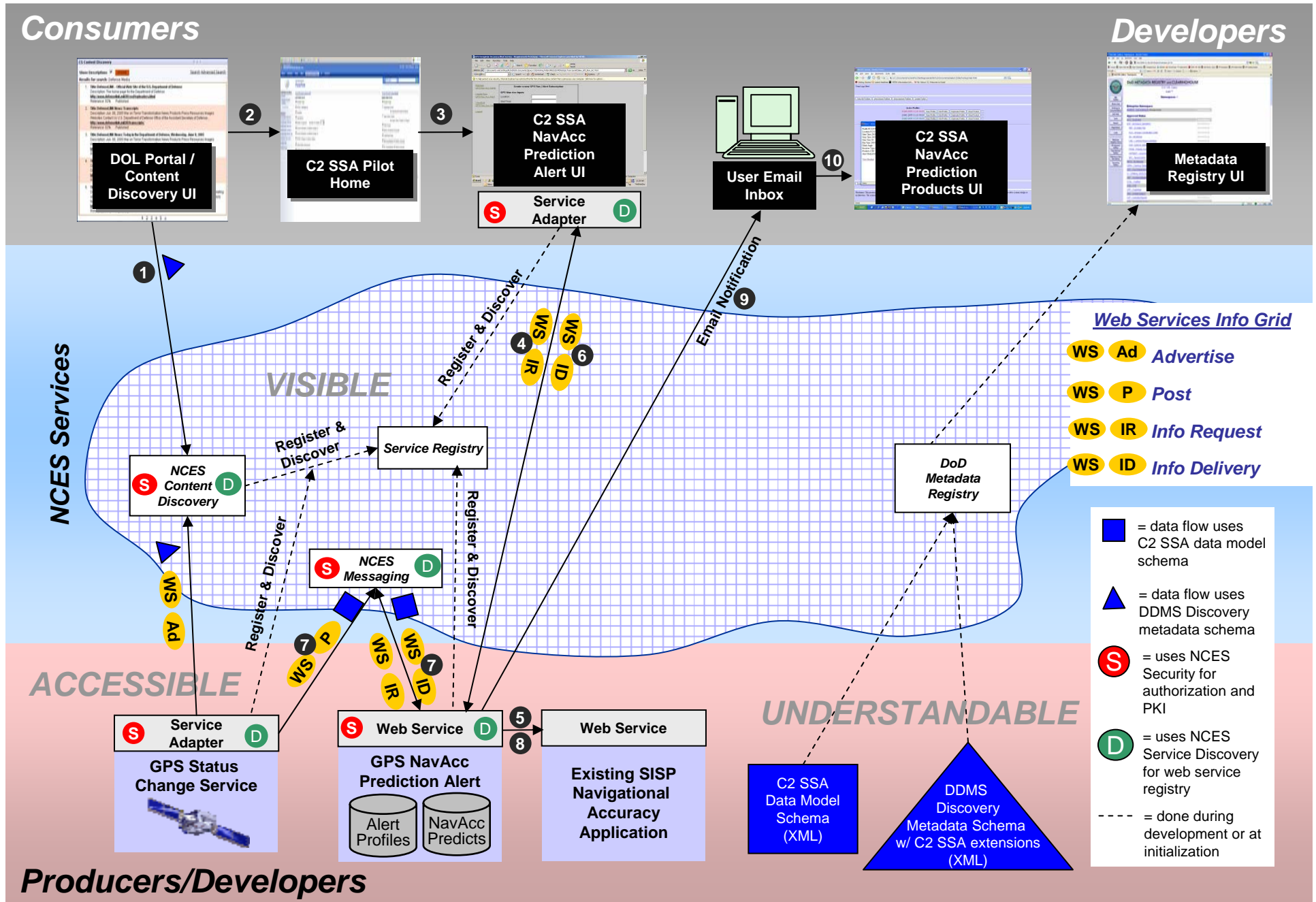
[Katrina Damage Assessment 14Sep-10am KMZ file](#)

UNCLASSIFIED/FOUO

C2 SSA COI DSCS Link Status Service UDOP (as of 1 Dec 2005)



C2 SSA COI NavAcc Prediction Alert Service UDOP (as of 1 Dec 2005)



DoDI 5000.2 *requires* pilots!



Department of Defense
INSTRUCTION

NUMBER 5000.2
May 12, 2003

USD(AT&L)

SUBJECT: Operation of the Defense Acquisition System

- References: (a) DoD Instruction 5000.2, "Operation of the Defense Acquisition System," April 5, 2002 (hereby canceled)
 (b) DoD 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," April 5, 2002 (hereby canceled)
 (c) [DoD Directive 5000.1](#), "The Defense Acquisition System," May 12, 2003
 (d) through (bl), see enclosure 1

1. PURPOSE This Instruction:

- 1.1. Reissues reference (a) and cancels reference (b).
- 1.2. Implements reference (c), the guidelines of references (d) and (e), and current laws.
- 1.3. Establishes a simplified and flexible management framework for translating mission needs and technology opportunities, based on approved mission needs and requirements, into stable, affordable, and well-managed acquisition programs that include weapon systems and automated information systems (AISs).
- 1.4. Consistent with statutory requirements and reference (c), authorizes Milestone Decision Authorities (MDAs) to tailor procedures to achieve cost, schedule, and performance goals.

1

3.3.2.1. ... requirements are refined through demonstration and risk management ... requirements for future increments depend on feedback from users ...

3.6.5. ... Multiple technology development demonstrations may be necessary ...

3.6.6. ... identification and development of the technologies necessary for follow-on increments continues in parallel with the acquisition of preceding increments...



Post MS-B programs can (and should) spend current-year funds on pilot demonstrations *to define the next increment!*

Pilots define the CDD, not the reverse



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1

3.3.2.1. ... requirements are refined through demonstration and risk management ... requirements for future increments depend on feedback from users ...

3.6.7. The project shall exit Technology Development when ... the technology for that increment has been demonstrated ... During Technology Development, the user shall prepare the Capability Development Document (CDD) ...



**Tech demos for the next increment happen *before* the CDD is written.
*Don't let JCIDS bog you down!***