



CIO/NII
Enabling Net-Centric Operations



DELIVERING THE POWER OF INFORMATION

TRANSFORMING THE NATIONAL DEFENSE TEAM

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TRANSFORMING NATIONAL DEFENSE NET-CENTRIC



National Security Strategy: *Transform America's national security institutions to meet the challenges and opportunities of the twenty-first century.*



National Defense Strategy: *We will conduct network-centric operations with compatible information and communications systems, usable data, and flexible operational constructs. Beyond battlefield applications, a network-centric force can increase efficiency and effectiveness across defense operations, intelligence functions, and business processes... Transforming to a network-centric force requires fundamental changes in process, policy, and culture.*



National Military Strategy: *...creation of a collaborative information environment that facilitates information sharing, effective synergistic planning, and execution of simultaneous, overlapping operations... on demand to defense policymakers, warfighters and support personnel.*





DOD NET-CENTRIC DATA STRATEGY

(9 MAY 2003)

PURPOSE

- Describes a vision for a net-centric environment and the data goals for achieving that vision
- Defines approaches and actions that DoD personnel will have to take as users—whether in a role as consumers and producers of data or as system and application developers

DoD Directive 8320.2 (signed December 2, 2004) directs the implementation of the DoD Net-Centric Data Strategy

“The... 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 strategy also introduces management of data within communities of interest (COIs) rather than standardizing data elements across the Department.” - John P. Stenbit (former DoD CIO)

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DOD NET-CENTRIC SERVICES STRATEGY

(MAY 2007)

PURPOSE

- Describes the DoD's vision for establishing a Net-Centric Environment that increasingly leverages shared services and Service Oriented Architecture (SOA)
- Expands upon the DoD Net-Centric Data Strategy by connecting services to the Data Strategy goals

DoD and Intelligence Community (IC) are partnering to create a DoD and IC Net-Centric Services Strategy

*"The Department of Defense (DoD) Net-Centric Services Strategy (NCSS) reflects the recognition by the DoD that this **services oriented approach can result in an explosion of capabilities** for our warfighters and decision makers, thereby **increasing operational effectiveness.**" - John G. Grimes (DOD CIO)*

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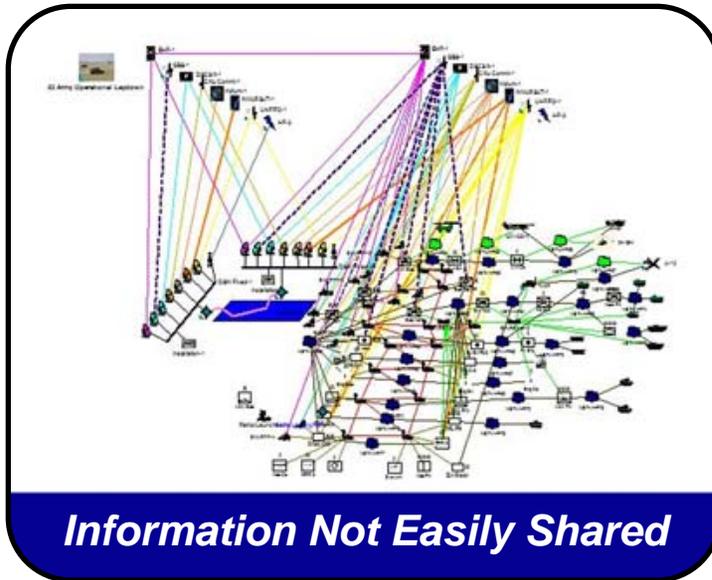




NET-CENTRIC DATA SHARING VISION

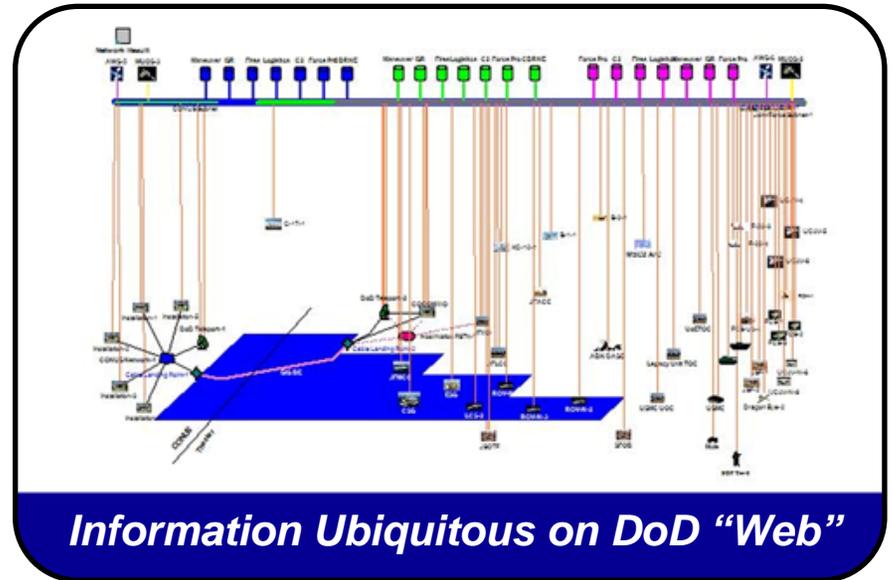
TODAY

- Pre-determined “point to point” connections within systems and applications on disparate networks
- Producer “pushes” information to pre-defined consumers



FUTURE

- Systems and applications are web-enabled to expose their information
- Authorized known & unanticipated consumers “pull” or “subscribe to” what they need regardless of who produced the information



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SOURCE: Mr. Mike Krieger, OASD(NII)/DoD CIO



NET-CENTRIC DATA SHARING BENEFITS

DATA SHARING

INFORMATION

Manual

Electronic

Net-Centric

**Data
+
Interpretation
and Context**

**EFFECTIVE
MILITARY
AND
GOVERNMENT
OPERATIONS**

WHERE WE ARE TODAY



WHERE DOD NET-CENTRIC STRATEGIES GET US



**Value Added
Services**

Operational Perspective: Increased accuracy, effectiveness and agility to respond to dynamic information sharing needs and changing enemy tactics

Acquisition Perspective: Faster delivery, built-in interoperability, increased flexibility and lower costs



THE SITUATION AND PROPOSED SOLUTION

CURRENT INFORMATION SHARING CHALLENGES

NET-CENTRIC DATA STRATEGY TENETS (DoD DIRECTIVE 8320.2)

IMPLEMENTATION APPROACHES



NEEDED DATA

User **UNWARE** information exists

This block illustrates the challenge where users are unaware of existing information. It features a red question mark icon, a blue callout box with the text 'User UNWARE information exists', and a background illustration of orange data cylinders and a white cylinder labeled 'NEEDED DATA'.

VISIBLE



Advertise Information Holdings ("Tag" Data)

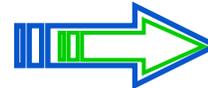


NEEDED DATA

User knows it exists, but **CANNOT ACCESS IT**

This block illustrates the challenge where users know information exists but cannot access it. It features a yellow padlock icon, a blue callout box with the text 'User knows it exists, but CANNOT ACCESS IT', and a background illustration of orange data cylinders and a white cylinder labeled 'NEEDED DATA' behind grey vertical bars.

ACCESSIBLE



*Web Enable Sources
Remove Impediments —
"Need to Share"*

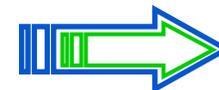


!@#\$%^&*

User can access information, but cannot exploit it due to **LACK OF UNDERSTANDING**

This block illustrates the challenge where users can access information but cannot exploit it due to a lack of understanding. It features a blue callout box with the text 'User can access information, but cannot exploit it due to LACK OF UNDERSTANDING', a speech bubble with symbols, and a background illustration of a man in a suit and the Department of Defense seal.

UNDERSTANDABLE



*Communities of Interest (COIs) —
Shared Vocabularies*

WHAT VISIBLE AND ACCESSIBLE MEANS



Search results for "CENTCOM Air Tasking Order":

- Web Results 1 - 10 of about 24,400 for CENTCOM Air Tasking
- [CENTCOM Theater Battle Management Core System](#)
TBMCS is the airwarplanning tool which provides the ACE Comm automated tools necessary to generate, disseminate and execute Tasking Order ...
- tbmcs.centcom.smil.mil/ - 16k - Cashed - Similar pages

TBMCS "advertises" that it has ATOs for the AOR

CENTCOM TBMCS

- [Mission Planning](#)
 - [Air Tasking Order \(ATO\)](#)
 - [Airspace Control Order \(ACO\)](#)
 - [Friendly Order of Battle \(FrOB\)](#)
 - [Target Management \(TGT\)](#)
 - [Enemy Order of Battle \(EnOB\)](#)

Link takes authorized user to TBMCS website without need for additional access controls

Events	Aircraft	ControlAgency	Deviations	WAGActivities			
Event Type	Event Location	Event Altitude	Event MType	Event Pri	Planned On	Planned Off	Es
TAKEOFF	LEMO				Oct25 2349		
STATION	CAP3	200	AR	1B2	Oct26 0916	Oct26 1009	
REFUEL	CAP3	220	AR	4A1	Oct26 0930	Oct26 1031	
LANDING	LTAG		CNTNG		Oct26 1309		
AIRMOVE	LTAG		CNTNG		Oct26 1309	Oct27 0539	
TAKEOFF	LTAG		CNTNG		Oct27 0539		
LANDING	ORBD		CNTNG		Oct27 0704		
AIRMOVE	ORBD		CNTNG		Oct27 0704	Oct27 1019	

Link on TBMCS website takes user to ATO data

Simulated screen captures for demonstration purposes only.

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MARITIME DOMAIN AWARENESS (MDA) COI PILOT

Gain knowledge of global maritime environment through net-centric exploitation of legacy Automatic Identification System (AIS) sources from Navy (DoD), Coast Guard (DHS), Department of Transportation (DoT)

Eight month effort to deliver capability:

- Sources tagged with discovery metadata **(VISIBLE)**
- Web services provide source data to user portals **(ACCESSIBLE)**
- Common vocabulary, schema describes shared information **(UNDERSTANDABLE)**



Improved awareness from fusion of disparate sources.



EXAMPLES OF ADDITIONAL NET-CENTRIC INFORMATION SHARING OPPORTUNITIES UNDERWAY

BLUE FORCE TRACKING (BFT) COI

- Developing reference implementation of the BFT Information Exchange Standard & Service across the Strategic – Operational – Tactical environments so joint/multinational commanders can exploit blue force information to reduce fratricide

STRIKE COI

- Enabling accelerated strike planning by providing situational awareness information (blue, red, gray force) from now to 12 hours; includes piloting of DoD/IC universal core for “what, when, where”

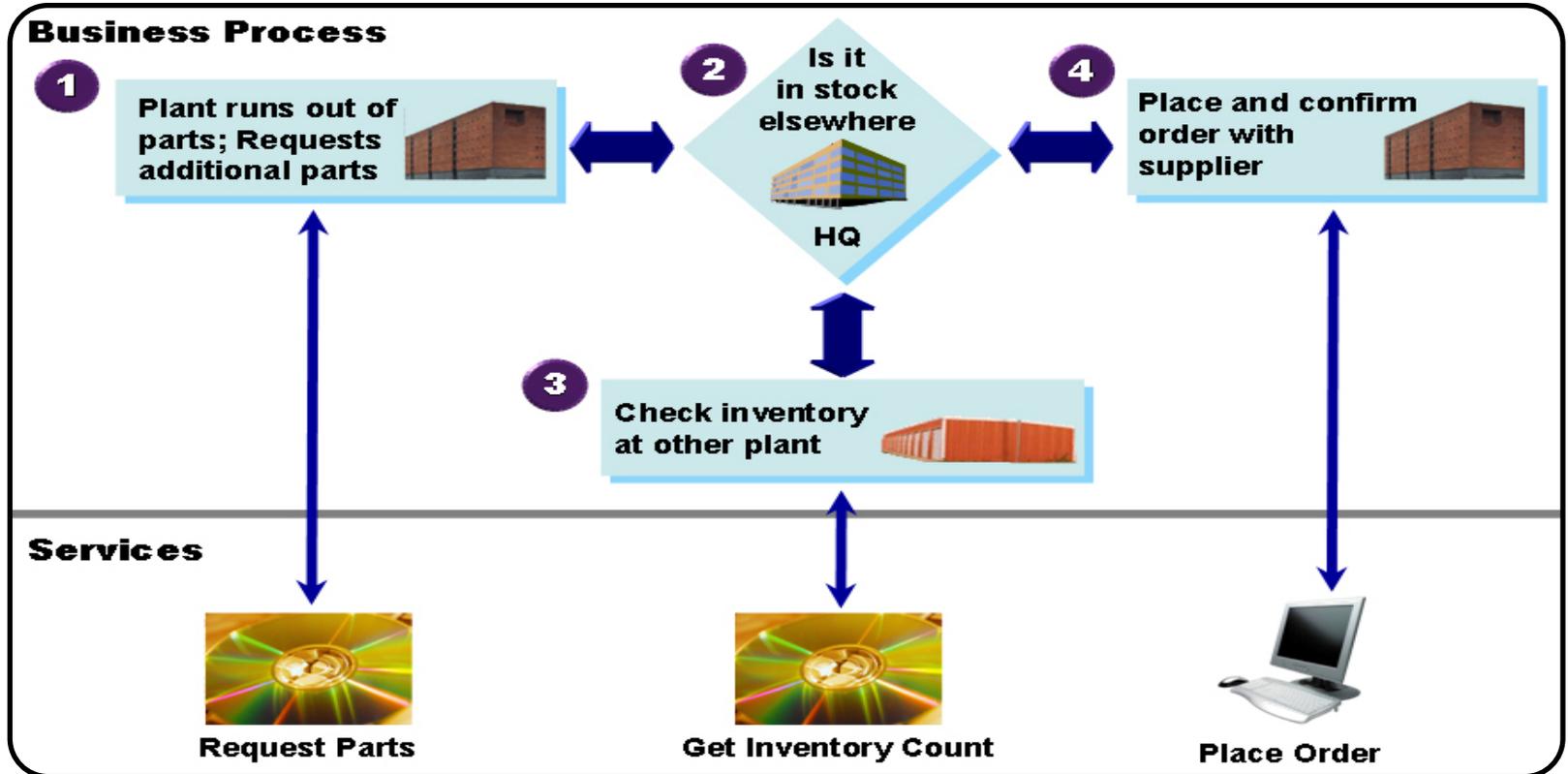
IT MANAGEMENT COI

- Developing a pilot to “pull” IT management data from the Military Service systems to produce the DoD FISMA C&A report

Unanticipated users can exploit the power of information.



WHAT IS SERVICE ORIENTED ARCHITECTURE?

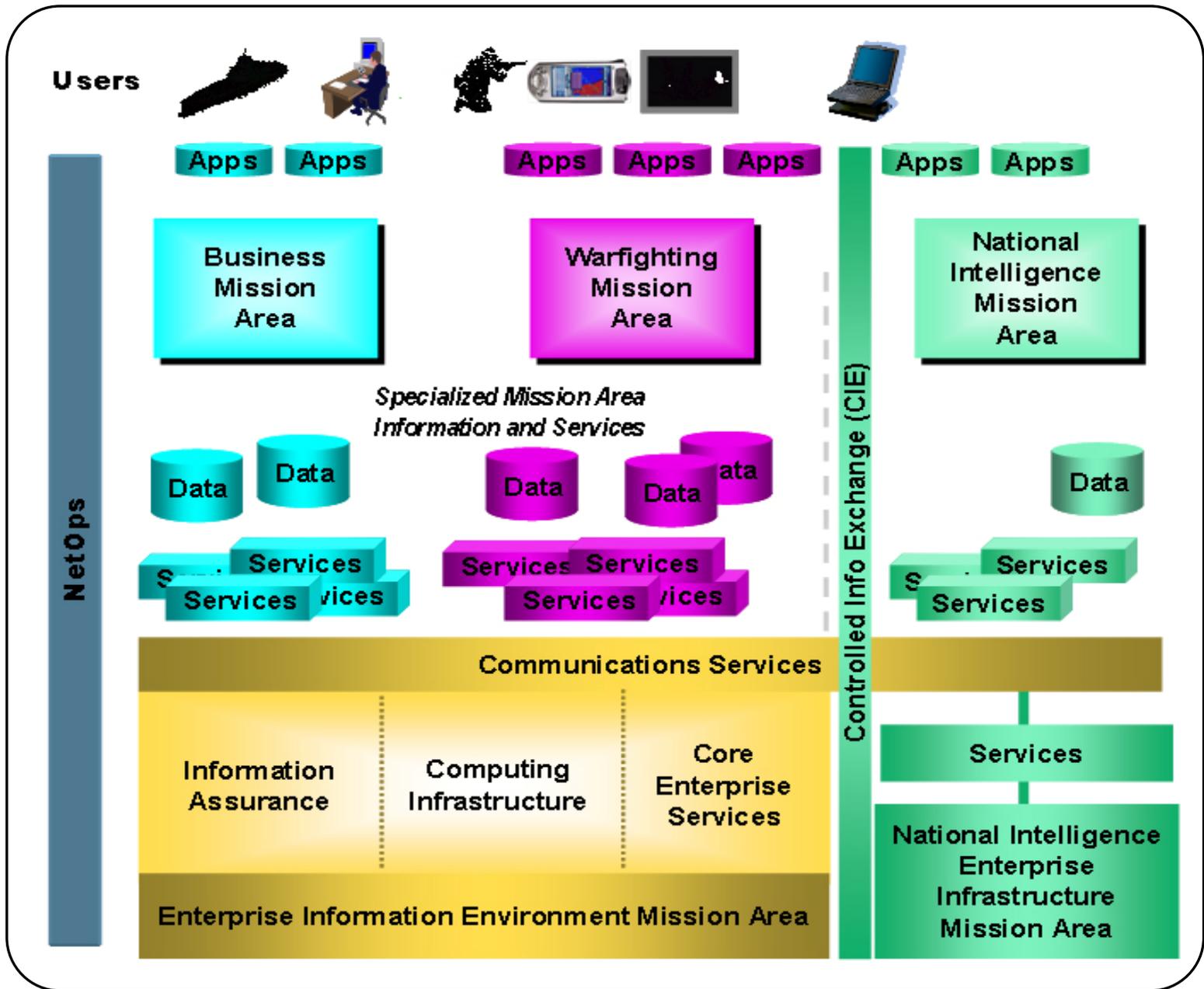


- SOA allows for describing an environment in terms of:
 - Shared business functions
 - Enabling services as building blocks
- The DoD will establish and enforce:
 - How the building blocks will be operated
 - How the building blocks will be made available to be used by the enterprise
- Using these building blocks will facilitate interoperability in the enterprise, providing:
 - Agility
 - Improved information sharing

OPERATING & GOVERNING THE ENTERPRISE SOA



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CORE ENTERPRISE SERVICES

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End-User Consumer

“What data exists? ”
 “How do I access the data? ”
 “How do I know this data is what I need? ”
 “How can I tell someone what data I need? ”



End-User Producer

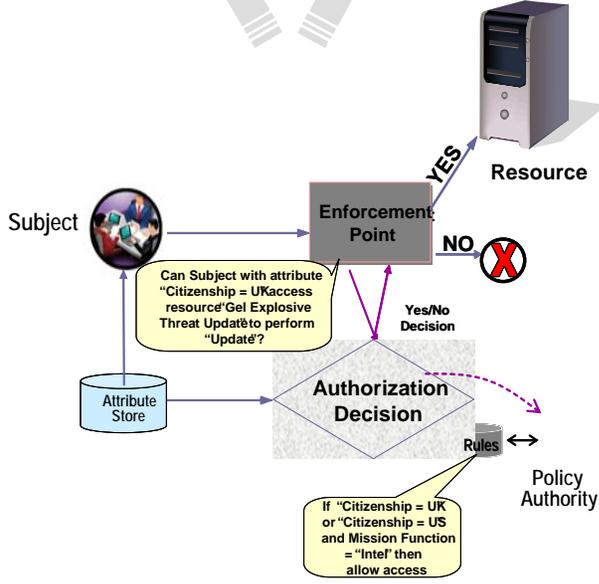
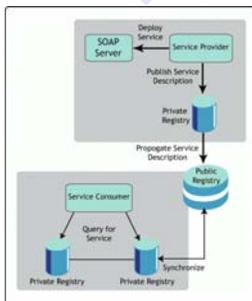
“How do I share my data with others? ”
 “How do I manage access to my data? ”
 “How do I describe my data so others can understand it? ”



Content Discovery



Service Discovery



**Credential Validation
Attribute Based Access Control**

Data Catalog

? Metadata Services

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



Service Management



GOALS FOR THE NET-CENTRIC SERVICES STRATEGY

GOAL	DESCRIPTION
PROVIDE SERVICES	Make information and functional capabilities as services on the network.
USE SERVICES	Use existing services to satisfy mission needs before creating duplicative capabilities.
GOVERN THE ENTERPRISE SOA	Establish the policies and processes for services in the enterprise SOA to ensure execution is aligned with interoperability and information sharing objectives.





PROVIDING SERVICES

- **Providers create services on the network to share information and provide functional capability:**
 - Provide a description of the service and publish to an enterprise registry
 - Build & operate the service
 - Manage the performance and Lifecycle of the service
- **Mission areas will define:**
 - Mission and business processes and the enabling services
 - Services will be implemented
 - By modifying or re-using existing IT systems, or
 - New development
- **Enterprise Information Environment will provide a small set of core enterprise services**





USING SERVICES

- **Build new business/mission processes using existing services provided by mission areas before promoting investment in new systems/services**
- **Establish a mechanism to provide feedback on perceived value, performance and usability of services**
- **Mandate use of core enterprise services**





GOVERNANCE

- **Governance means establishing and enforcing how DoD Components agree to provide, use, and operate services.**
 - **Identifying the attributes of providing, using and operating services that have to be governed at what level**
 - **Establishing lines of responsibility, authority, and communication for making decisions about services across the lifecycle of services**
 - **Establishing the measurement, policy, and control mechanisms to ensure that individuals carry out their responsibilities**

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Intent of the DoD CIO is to limit enterprise governance to those attributes critical to the realization of an enterprise SOA



ATTRIBUTES OF GOVERNANCE

GOAL	DESCRIPTION
MAKE SERVICES VISIBLE	<ul style="list-style-type: none">▪ Publish metadata to an enterprise services registry
MAKE SERVICES ACCESSIBLE	<ul style="list-style-type: none">▪ Accessibility decisions made by providers▪ Providers use security services provided by EIEMA to ensure widest possible access
MAKE SERVICES UNDERSTANDABLE	<ul style="list-style-type: none">▪ Communities of interest define vocabularies and business rules▪ Service metadata captured in a Service Specification Template<ul style="list-style-type: none">- Service semantics- Service access- Security mechanisms or restrictions- Contact Information- Service-level characteristics- Performance information.





ATTRIBUTES OF GOVERNANCE

(CONTINUED)

GOAL	DESCRIPTION
MAKE SERVICES TRUSTED	<ul style="list-style-type: none">▪ Provide validated information via registries▪ Service Level Agreements
INTEGRATE SERVICE ORIENTATION INTO KEY PROCESSES	<ul style="list-style-type: none">▪ Work with process owners for<ul style="list-style-type: none">–Acquisition Process–Testing, Certification, and Accreditation–Portfolio management▪ Portfolio Managers will continually assess use of services and adherence to COI-defined vocabularies and business rules
PROVIDE NETOPS CAPABILITIES TO MONITOR AND MANAGE SERVICES	<ul style="list-style-type: none">▪ Provide visibility of<ul style="list-style-type: none">–Real time operational status–Long term service level performance





FEDERATION OF SERVICES

- Federation is a form of additional governance where:
 - *The capability is implemented using information sources or capabilities from a variety of service providers who are distributed across the enterprise, and all service providers contributing to the federated capability agree to the definition of the service interfaces and operational performance characteristics*
- The additional governance required by the federation of services is defined by, agreed to, and mutually enforced by the distributed set of providers across the enterprise.

The EIEMA will govern the use of federation in the Enterprise SOA to ensure that the various federation management models are consistently applied and understood.





THE MISSION ASSURANCE IMPERATIVE:

*SUCCEEDING AT BOTH INFORMATION SHARING
AND INFORMATION ASSURANCE*



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MISSION ASSURANCE CONTINUING TO RAISE THE BAR

WE CONTINUE TO MAKE PROGRESS

- GIG IA Architecture v 1.1 published
- Over 12 Million Served ... and now serving the “HSPD-12 CAC”
- Cryptographic Log-on – Improving the security of our networks
- Configuration Management ... Microsoft Vista
- Biometrics Implementation and EXCOM
- Improving Force Protection
- Wireless Security/Authentication

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MISSION ASSURANCE CONTINUING TO RAISE THE BAR

BUT OPPORTUNITIES STILL ABOUND...

- Improving the survivability, sustainability and resiliency of our networks
- Information Integrity
- Continuity of Operations
- Aligning testing efforts/certification and accreditation
- Delivering Net-Centric Enterprise Services
- Expanding our Identity Management Efforts
 - NSA Enterprise Security Management efforts
 - Attribute-based Access Control (EIEMA effort)





MISSION ASSURANCE CONTINUING TO RAISE THE BAR

BUT OPPORTUNITIES STILL ABOUND...

- Focusing on Mission Assurance – Critical Infrastructure Protection
- Protecting our Privacy
 - Data At Rest Encryption – DoD ESI/SMARTBuy
 - Privacy Impact Assessments
- Continuing to align and expand our Biometrics efforts
- Telling the story – results-oriented / mission effectiveness
- Aligning to standards and open architecture
- Managed Services
- Globalization – Software Assurance
- Risk Management





“I CAN GET THE INFORMATION I NEED” NET-CENTRIC INFORMATION ENVIRONMENT

WHEN I need it



WHERE I need it



HOW I need it



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Better decisions faster – Decisive actions sooner.



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FOSTERING NET-CENTRIC SOFTWARE DEVELOPMENT

Software helps us build a better network...

*...but can the network help us
build better software?*



POLICY ISSUES FOR SOFTWARE RE-USE

- **DoD owns a huge amount of software code**
- **DoD can use open-source software code**
(per CIO policy dated 28 May 2003)
- **Actual software re-use is rare**
 - Difficult to find existing code
 - PMs unlikely to share code
 - Often ownership/usage rights are unclear
- **In the open-source software community, re-use is common. How can we learn and apply those lessons?**



SOURCE CODE IS DATA

(AS DESCRIBED BY THE DATA STRATEGY)

How do we make source code visible, accessible, and understandable within the DoD?

(i.e. How do we apply the data strategy to software?)

- **Discovery metadata for software**
 - Function
 - Platform
 - License terms / contract number
 - Releaseability
 - Accreditation
- **“Shared space”**
 - Mechanism to share software that the DoD owns (or to which it has some rights)





(PROPOSAL)

SOFTWARE DEVELOPMENT COI

INITIAL DELIVERABLES:

- Discovery metadata for software (DDMS extensions)
- “Shared space” for software (notionally akin to Sourceforge.net)
- Policy recommendations to the CIO
 - Address gaps, conflicts, and misconceptions that prevent the use (or re-use) of existing software

FUTURE DELIVERABLES: TBD

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THE POWER OF INFORMATION

ACCESS • SHARE • COLLABORATE

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