



DoD Information Enterprise Architecture DoD IEA



Department of Defense

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Creating an Information Advantage

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Briefing Outline

- Background
- DoD IEA, V1.0
- Overview of DoD IEA, V1.1
 - Appendix D: Using and Applying the DoD IEA
 - Appendix E: Compliance with the DoD IEA
 - Appendix F: Mapping of NCOW Reference Model Content to DoD IEA
- Way Ahead



Background

DoD CIO Responsibilities

- **40 U.S.C. Section 1425:** Develop, maintain, and facilitate the implementation of a sound and integrated information technology architecture for the executive agency
- **Section 2223, Title 10 :** “...review and provide recommendations to the Secretary of Defense on Department of Defense budget requests for information technology and national security systems....”
- **DoDD 5144.1:**
 - **OSD Principal Staff Assistant (PSA)** for net-centric policies and concepts (Normalize the description for Net-centricity)
 - DoD enterprise-level strategist and business advisor from information and IT perspective
 - Information and IT architect for the DoD enterprise
 - Lead the formulation and implementation of enterprise-level defense strategies from the information, IT, and net-centric perspective
 - Develop and implement net-centric policies, architectures, practices, and processes ...to enable Defense transformation



What is a Net-centric Strategy?

- Outlines a vision for managing “content” within a Net-centric environment and directs compliance
- Example: Net-Centric Data Strategy
 - Approved May 2003
 - Vision, Goals, Approaches to data goals, Evolution of the strategy
- Evolution of a strategy: DoD Directive and Implementation Guide. Will impact standards and transition plans



Background Net-Centric Strategies

- **Major strategies**
 - Data (9 May 2003)
 - Services (4 May 2007)
 - Information Assurance (26 April 2006)
 - Computing Infrastructure (September 2007)
 - Spectrum Management (3 August 2006)
 - NetOps (February 2008)
 - Communications/Transport
 - Information Sharing (4 May 2007)
- **Strategies managed by specific organizations within the ASD(NII)/DoD CIO**
- **The DoD IEA unifies the Strategies**
 - IEA will “house” all strategies with their architecture artifacts
 - Unifies the concepts embedded in the DoD’s net-centric strategies into common vision

Background: DoD IEA, V1.0

- Department-wide effort
- Approved 11 April 2008
- Purpose:
 - Unifies the concepts embedded in the DoD's net-centric strategies into common vision
 - Drives common solutions and promotes consistency
 - Describes the integrated Defense Information Enterprise and the rules for information assets and resources that enable it
 - Fosters alignment of DoD architectures with the enterprise net-centric vision





DIEA Priorities

- **Data and Services Deployment (DSD)** – Decouple data and services from the applications and systems that provide them, allowing them to be visible, accessible, understandable and trusted. Lay the foundation for moving the DoD to a Service-Oriented Architecture (SOA).
- **Secured Availability (SA)** – Ensure data and services are secured and trusted across DoD. Allow users to discover data and services and access them based on their authorization.
- **Computing Infrastructure Readiness (CIR)** – Provide the necessary computing infrastructure and related services to allow the DoD to dynamically respond to computing needs and to balance loads across the infrastructure.
- **Communications Readiness (CR)** – Ensure that an evolvable transport infrastructure is in place that provides adequate bandwidth and end-to-end, seamless net-centric communications capability across all GIG assets.
- **NetOps Agility (NOA)** – Enable the continuous ability to easily access, manipulate, manage and share any information, from any location at any time.



DIEA, Version 1.0

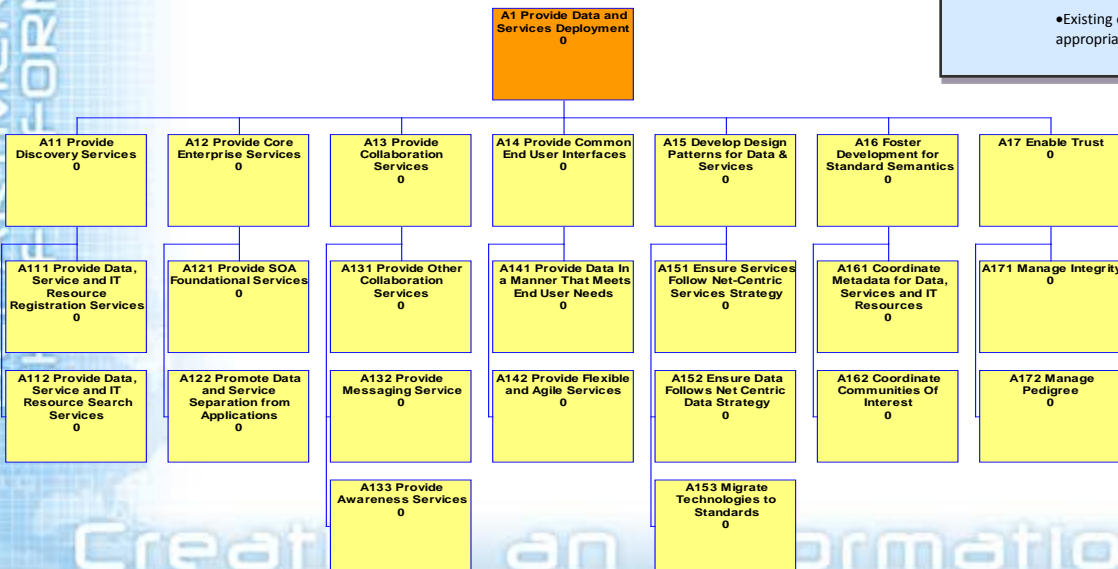
Priority Area Example: DSD

Data & Services Deployment Principles

- Data, services and applications belong to the DoD Enterprise. Information is a strategic asset that must be accessible to the people who need it to make decisions.
- Data, services, and applications should be loosely coupled to one another. The interfaces for mission services that an organization provides should be independent of the underlying implementation. Likewise, data has much greater value if it is visible, accessible and understandable outside of the applications that might handle it.
- Only handle information once (the OHIO principle). Information that exists should be reused rather than recreated.
- Semantics and syntax for data sharing should be defined on a community basis. Information sharing problems exist within communities; the solutions must come from within those communities.
- Data, services and applications must be visible, accessible, understandable, and trusted to include consideration of “the unanticipated user”. All needs can never be fully anticipated. There will inevitably be unanticipated situations, unanticipated processes, and unanticipated partners. By building capabilities designed to support users outside of the expected set, the Department can achieve a measure of agility as a competitive advantage over our adversaries.

Data & Services Deployment Business Rules

- Authoritative data assets, services, and applications shall be accessible to all authorized users in the Department of Defense, and accessible except where limited by law, policy, security classification, or operational necessity.
- COIs will determine which data sources are authoritative and will not declare any source authoritative without establishing a valid pedigree.
- All authoritative data producers and capability providers shall describe, advertise, and make their data assets and capabilities available as services on the GIG.
- All authoritative data assets and capabilities shall be advertised in a manner that enables them to be searchable from an enterprise discovery solution.
- Data will be described in accordance with the enterprise standard for discovery metadata (the DoD Discovery Metadata Specification (DDMS)).
- Mission or business functions will be made available to the enterprise as a network-based service with a published, well-defined interface.
- Services shall be advertised by registering with an enterprise service registry.
- COIs should develop semantic vocabularies, taxonomies, and ontologies.
- Semantic vocabularies shall re-use elements of the DoD Intelligence Community (IC)-Universal Core information exchange schema.
- Vocabularies, taxonomies, and ontologies must be registered with the enterprise for visibility, re-use and understandability.
- Existing enterprise data, services, and end-user interfaces shall be used whenever possible, practical and appropriate, instead of re-creating those assets.





DoD IEA, V1.1

- Recognized more work to be done
- DoD CIO decision to merge NCOW Reference Model with DIEA, V1.0
- The Immediate Task:
 - DIEA, V1.0 evolution (page 27)
 - Merge related enterprise architecture guidance (NCOW Reference Model)
 - Develop DIEA compliance guideline document using NCOW RM compliance documentation
- Developed three appendices
 - Appendix D: Applying the DoD IEA
 - Appendix E: Compliance with the DoD IEA
 - Appendix F: Mapping of NCOW RM content to DoD IEA
 - Focused upon amplification of “Using and Applying Principles and Business Rules” wrt the customer set identified in V1.0: It architects, PEOs and PMs, IRBs, CPMs, CIOs (DIEA, v1.0, page 4/7)
- Department-wide review and comment: EA Summit
 - Review/comment period closed – mid December 2008
 - Comment adjudication completed; comments incorporated
- DoD CIO approval: May 2009



DoD IEA, V1.1

- DoD IEA, V1.0 (original document with minor editorial changes)
- Appendix D: Applying the DoD IEA
- Appendix E: Compliance with the DoD IEA
- Appendix F: Mapping of NCOW RM to the DoD IEA



Appendix D

Applying the DoD Information Enterprise Architecture (DoD IEA)



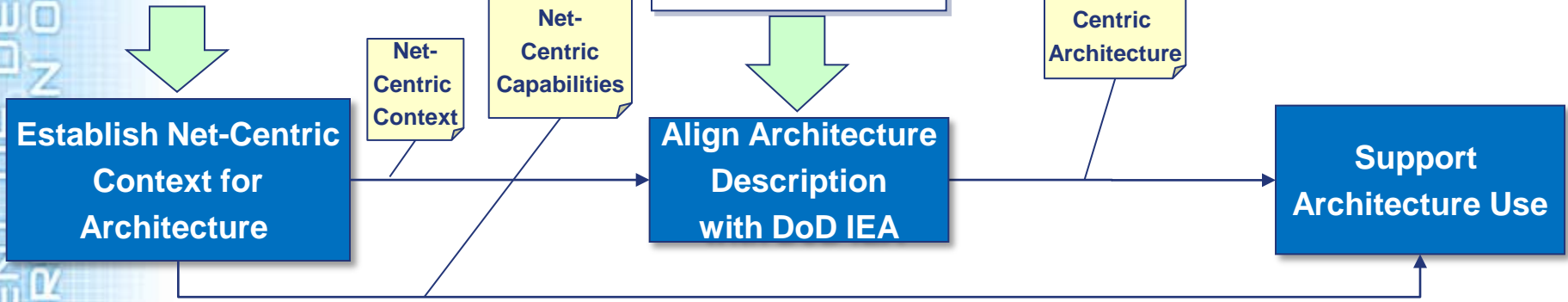
Applying the DoD IEA

- Appendix D of the DoD IEA v1.1
- Purpose: Describe an approach for applying DoD IEA in support of:
 - IT Architects
 - IT Investment Managers (IRBs, CPMs, CIOs, etc.)
 - Managers of IT Programs (Component PEOs, PMs, and corresponding functional requirements managers)

Appendix D -- Process for Applying DoD IEA

- DoD IEA :
 - Priority Areas
 - Principles/Rules
 - High-Level Activities
- Net-Centric Concepts
 - CCRP-developed foundation
 - Technical Federation
 - SOA
 - Technology Innovation
- JCA taxonomy and lexicon

- DoD IEA Glossary and related taxonomies
- DoD IEA:
 - Principles
 - Rules
 - Activities
 - Constraints
 - Mechanisms



- Understand net-centric content
- Identify DoD IE perspective of architecture
- Define net-centric context :
 - Align with DoD Net-Centric Vision
 - Identify net-centric architecture assumptions
 - Develop net-centric operational concept
 - Align with JCA taxonomy

- Use net-centric terminology in architecture description
- Incorporate applicable DoD IEA Principles

- Apply DoD IEA Rules
- Align operational activities and processes with related DoD IEA Activities

- Incorporate leaf-level DoD IEA Activities
- Apply DoD IEA Constraints and Mechanisms

All Tiers

Enterprise, Component Tiers

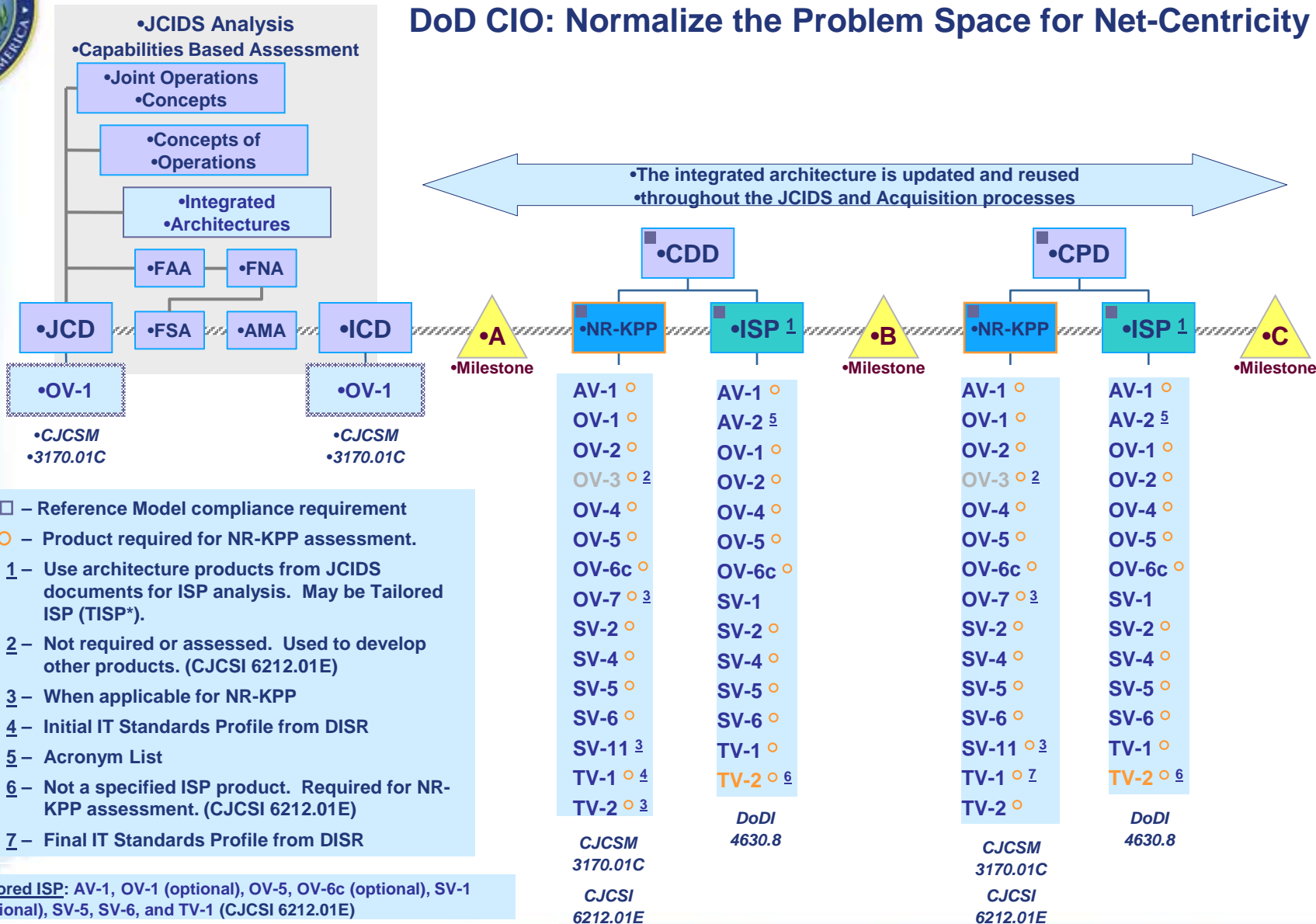
Program Tier

- Analyze architecture
- Support use of architecture in investment management
- Support use of architecture in program management



JCIDS, Acquisition, and Architecture Products

DoD CIO: Normalize the Problem Space for Net-Centricity



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* Tailored ISP: AV-1, OV-1 (optional), OV-5, OV-6c (optional), SV-1 (optional), SV-5, SV-6, and TV-1 (CJCSI 6212.01E)



Appendix E

Compliance with the DoD Information Enterprise Architecture



Compliance with the DoD IEA

- Appendix E of the DoD IEA v1.1
- Purpose: Describes what compliance with the DoD IEA means and demonstrates ways to convey compliance
- Aligns with Appendix D, Applying the DoD IEA
- Contains:
 - Compliance Template that describes compliance criteria and ways to demonstrate compliance
 - Examples of architecture description demonstrating compliance
 - Compliance Assessment Table that contains key compliance information



Appendix E Alignment with Appendix D

Appendix D - Applying the DoD IEA		Appendix E -Compliance Areas
2.3.1 Establish Net-Centric Context for Architecture		
	2.3.1.1 Understand Net-Centric Content	
	2.3.1.2 Identify DoD IE Perspective of Architecture	* Identify DoD IE Perspective of Architecture
2.3.1.3 Describe the Architecture's Net-Centric Context		
	2.3.1.3.1 Align with DoD NC Vision	* Align with DoD NC Vision
	2.3.1.3.2 Identify Net-Centric Architecture Assumptions	* Identify NC Architecture Assumptions
	2.3.1.3.3 Develop a Net-Centric Operational Concept	* Develop a NC Operational Concept
	2.3.1.3.4 Align with Net-Centric JCA	* Align with NC JCA
2.3.2 Align Architecture Description with the DoD IEA		
2.3.2.1 General alignment for All Architectures		
	2.3.2.1.1 Use Net-Centric Terminology in Architecture Description	* Use NC Terminology in Architecture Description
	2.3.2.1.2 Incorporate Applicable DoD IEA Principles	* Incorporate Applicable DoD IEA Principles
2.3.2.2 Alignment at and Component Tiers		
	2.3.2.2.1 Apply DoD IEA Rules	* Apply DoD IEA Rules
	2.3.2.2.2 Align Operational Activities and Processes with Related DoD IEA Activities	* Align Operational Activities and Processes with Related DoD IEA Activities
2.3.2.3 Alignment at Program Tier		
	2.3.2.3.1 Incorporate Leaf-Level DoD IEA Activities	* Incorporate Leaf-Level DoD IEA Activities
	2.3.2.3.2 Apply DoD IEA Constraints and Mechanisms	* Apply DoD IEA Constraints and Mechanisms



Appendix E Tab A

Compliance Area	Appendix D Application Reference	Appendix D Application of the DoD IEA	Appendix E Compliance Reference	Appendix E Compliance with the DoD IEA	Describe Content and Location of Demonstrated Compliance
A. Establish Net-Centric Context for Architecture					
A1. Identify DoD IE Perspective	Para. 2.3.1.2	Describe the DoD IE perspective as producer/provider, manager, consumer, or a combination of the three.	Para. 2.1.1.1	Describe the DoD IE perspective of the architecture in the AV-1 Overview and Summary Information, Purpose and Viewpoint section.	
A2. Align with DoD Net-Centric Vision	Para. 2.3.1.3.1	<ul style="list-style-type: none"> - Identify applicable Priority Areas. - Determine how to address the Priority Areas to align with the DoD Net-centric vision. - Consider the perspective(s) of the architecture. 	Para. 2.1.1.2	Describe the DoD IE of the architecture using DoD IEA Priority Area(s) descriptions in: <ul style="list-style-type: none"> - Functional Area Analysis (FAA) as part of specifying conditions. - Initial Capabilities Document (ICD) Operational Concept. - Capability Development Document (CDD) Concept of Operations Summary. 	
A3. Identify Net-Centric Architecture Assumptions	Para. 2.3.1.3.2	<ul style="list-style-type: none"> - Derive net-centric assumptions from the descriptions of applicable DoD IEA Priority Areas. - Consider foundational policy and applicable requirements associated with the technical federation, SOA, and technology innovation concepts. 	Para. 2.1.1.3	Describe net-centric assumptions in the AV-1 Overview and Summary Information, Architecture Project Identification.	



Appendix F

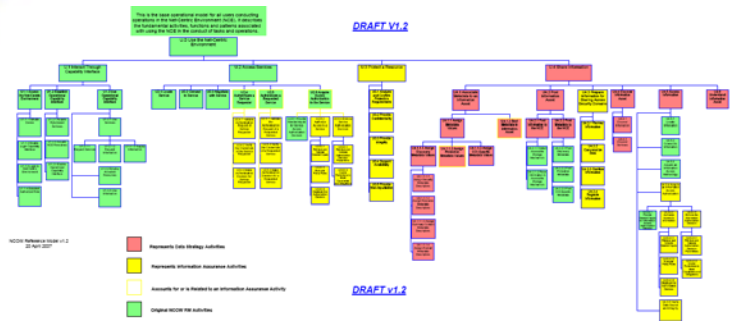
Mapping of the NCOW RM content to the DoD IEA



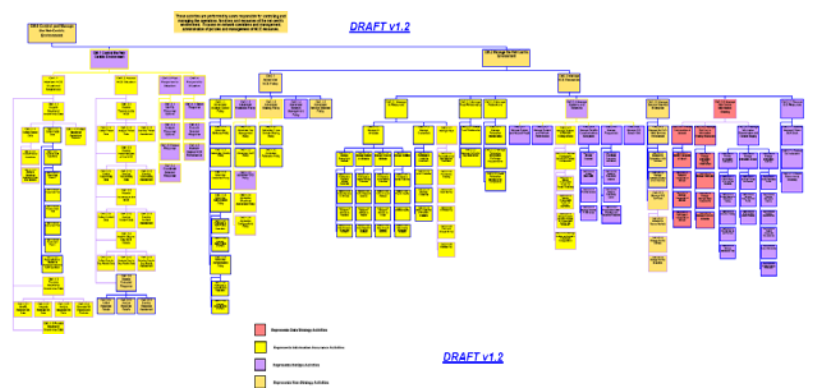
NCOW REFERENCE MODEL

Activity Decompositions

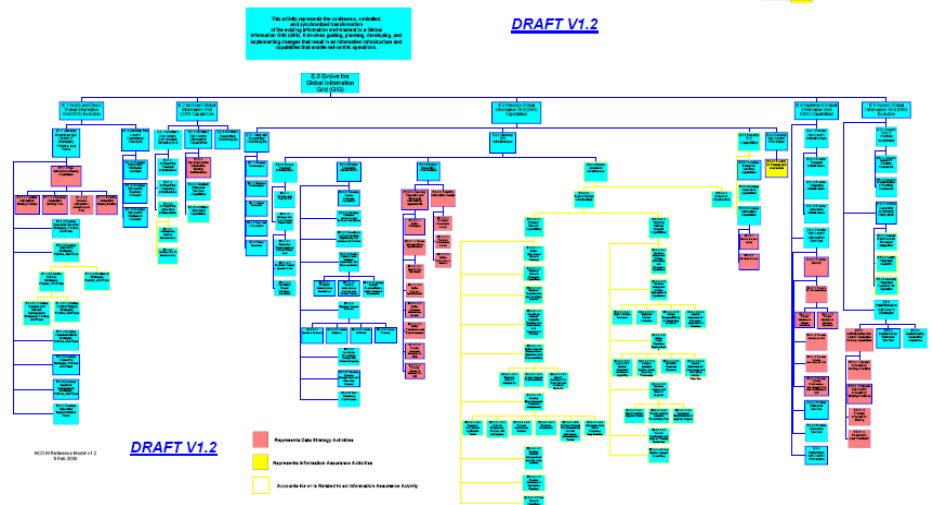
Use the GIG Decomposition



Control and Manage the GIG Decomposition



Evolve the GIG Decomposition



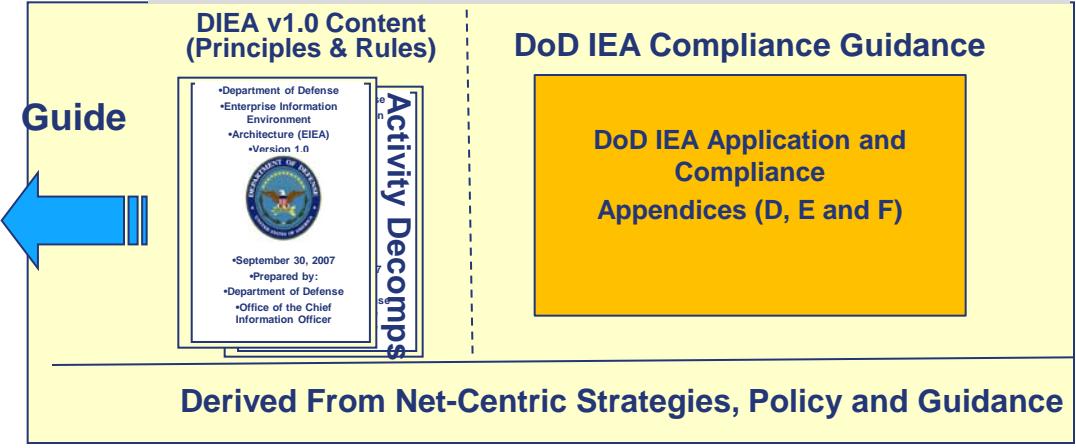
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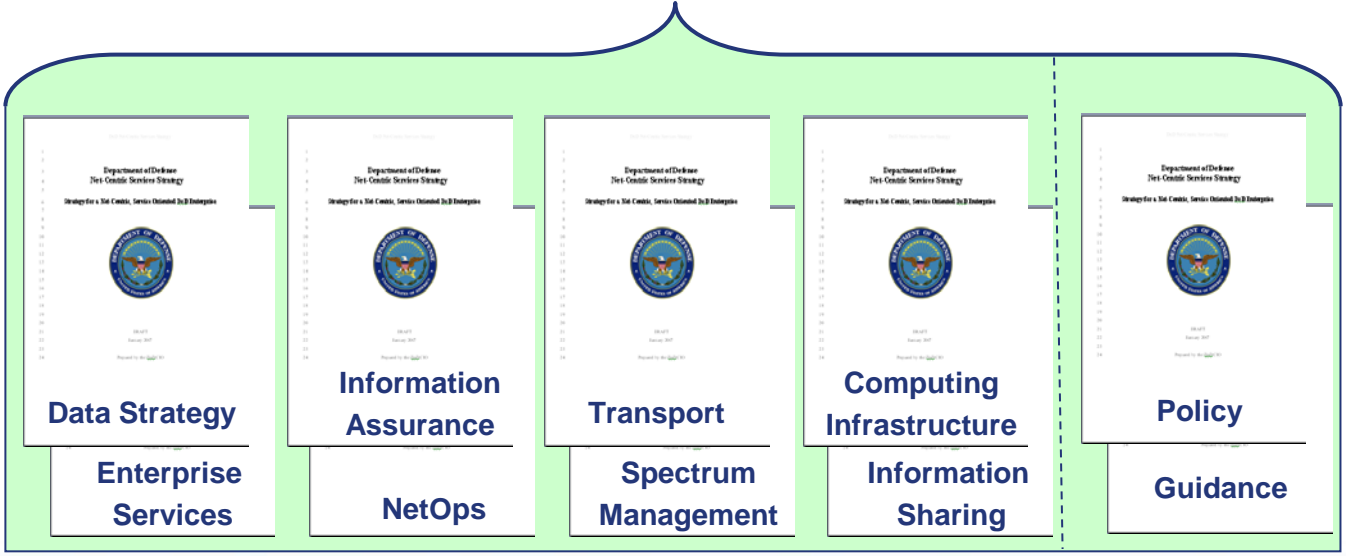
DoD IEA, Version 1.1

DoD IEA v1.1 - Net-Centric Guidance for Architecture and Decision-Making

- IT Architectures
- IRB/PfM
- PEO/PM



Net-Centric Strategies, Policy and Guidance



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Review and Comment - Status Enterprise Architecture Summit

- Review/comment period closed – mid December 2008
- Comment adjudication complete
- Changes incorporated
- DoD CIO approval signature – May 2009



Way Ahead: DoD IEA V2.0

- Refine existing products (Principles, Rules, Activities)
- Develop additional operational views – “particularly process models”
- Embed DoD IEA in decision-making and investment processes
- Further merge related net-centric information guidance (NCOW RM, Net-Centric Checklist) into DoD IEA
- Evolve compliance guidelines
- Continue to align DoD IEA and other key DoD direction/guidance/standards (JCSFL, “Blue Sheets,” GIG 2.0, GTG) to support portfolio and program decision-making
- Institutionalize DoD IEA in architecture development and maintenance and in support of CPM and PM compliance with net-centric requirements



Way Ahead: Enterprise Reference Architecture Cell

- **Components have expressed the need for more detailed guidance**
 - Enterprise patterns and processes
 - Army CIO/G-6 Comment on DoD IEA v1.1: “...establish a separate DoD IEA Reference Architecture with sufficient granularity to enable interoperability across the DOD IE/GIG. To foster such interoperability, these reference architectures would need to include processes, process patterns and service patterns, as well as service interfaces and metrics.”
- **Purpose:**
 - Develop reference architecture artifacts
 - Assist IT Decision Makers/Components/Programs/Solution Architects as directed
 - Assist in the proper application of the DoD IEA, DoDAF and DARS
 - Conduct architecture assessments as directed
 - Assess architecture compliance w/DoD IEA
 - Event Driven - Net Centric Reviews (ED-NCR)
 - JCIDS/DAS Milestone Reviews
- **Management:**
 - ERAC funded by and resources managed by EA&S
 - Taskings and guidance from the EGB/TSEARG



<http://www.defenselink.mil/cio-nii/sites/diea/>

Defense Information Enterprise Architecture

April 11, 2008

▼ [DIEA Mission](#)

▼ [DIEA Priorities](#)

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DIEA 1.0 Products

DIEA Architecture Description (OV-1)

- Project Charter (AV-1)
- Hierarchical Activity Model (OV-5)
- Principles and Rules (OV-6a)
- Glossary (AV-2)
-
- FAQs

Net-Centric Guidance

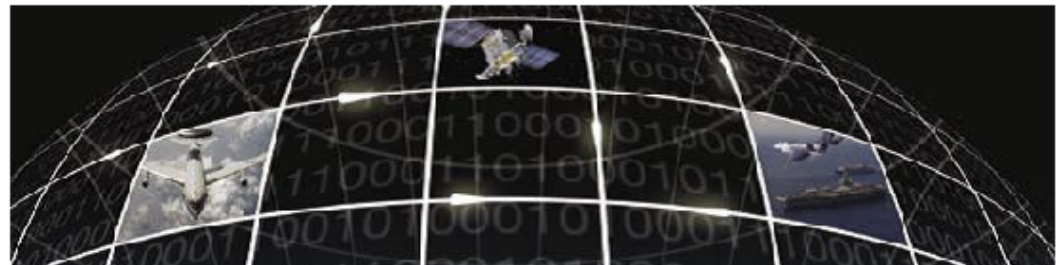
- DoD CIO Homepage
- DoD CIO Strategic Plan
- DoD Net-Centric Data Strategy
- DoD Net-Centric Services Strategy
- DoD Information Assurance Policy
- DoD Information Sharing Strategy
- DoD IT Portfolio Management Directive
- DoD Telecommunications Directive

Transition Partners

- Defense Business Transformation

Privacy and Web Policies

"Lead the DoD Enterprise to Achieve an Information Advantage for our People and Mission Partners"



Defense Information Enterprise Architecture Release

The Defense Information Enterprise Architecture version 1.0 (DIEA 1.0) provides a common Defense Information Enterprise foundation to support accelerated Department of Defense (DoD) transformation to net-centric operations. It presents the vision of net-centric operations and establishes near term priorities to address critical barriers that must be overcome in order to achieve the vision.

The Defense Information Enterprise Architecture consolidates underlying DoD Net-Centric policies to provide guidance for all DoD, across all portfolios, enabling informed discussions among decision-makers about key issues, and underpinning process improvements throughout the Department. Defense Information Enterprise Architecture 1.0 highlights the key principles, rules, constraints and best practices to which applicable DoD programs, regardless of Component or portfolio, must adhere in order to enable agile, collaborative net-centric operations.

Defense Information Enterprise Architecture Products

This website represents the main method for distributing Defense Information Enterprise Architecture 1.0. The full set of Defense Information Enterprise Architecture 1.0 products are available from the left side menu entitled "DIEA 1.0 Products" where users can access:



Questions



Service Oriented Architecture

Definition

A paradigm for defining, organizing, and utilizing distributed capabilities in the form of loosely coupled software services that may be under the control of different ownership domains. It provides a uniform means to offer, discover, interact with, and use capabilities to produce desired effects that are consistent with measurable preconditions and expectations.



Net-centric Vision and DIE

- Net-centric Vision
 - Source documents: DoD CIO N-c Strategies
 - Ability to function as one unified DoD enterprise
 - Rich information sharing environment where data and services are visible, accessible, understandable, and trusted
- Defense Information Enterprise
 - A federated environment within which information (data and services) are visible, accessible, understandable, and trusted
 - Includes the information itself, processes, activities, and resources necessary to create an information advantage across the DoD



Portfolio Management

- Process not well defined in DoD
- OMB A-130 defines a top level process
- Management functions:
 - Identification (criteria for selection)
 - Describes objectives/operational concept
 - Focus objectives to achieve N-c vision
 - N-c criteria derived from DoD IEA
 - Selection
 - Select best mix of PORs to achieve objective/ops concept
 - Use N-c criteria – should provide common language and context
 - Control
 - Outcome based performance measures to monitor/manage
 - = N-c criteria
 - Evaluation
 - Adjust portfolio based upon ability of POR to fulfill objectives



Investment Review Board Certification Process

- Components identify programs requiring certification
- PMs assemble certification package
- Pre-certification authorities, appointed by Component, validate the package
- Package submitted to appropriate IRB for review/adjudication
- IRB submits programs recommended for certification to designated Certification Authority (PSA level)
- If CA certifies the program, package submitted to Defense Business Systems Modernization Committee for obligation of funds
 - DoD CIO is CA for Business IT (Enterprise Governance Board)
 - Certification criteria will include N-c criteria



Impact of DoD IEA on DoDAF Products

- AV-1: Executive Summary
 - Context and concept of operations
 - Assumptions and constraints
 - Activities: directly incorporate, instances of, drill downs
 - Constraints and mechanisms
- AV-2: Integrated Dictionary
 - DoD IEA glossary
 - Terms from Principles and Rules
- OV-1: High Level Operational Concept Graphic
 - Textual description
- OV-5: Operational Activity Model
- OV-6a: Operational Rules Model
 - Business rules: DoD IEA Principles and Rules
- OV-6c: Operational Event Trace Description
 - Activities with sequence and timing attributes
 - Principles and rules embedded in the activities
- SV-4b: Services functionality Description
- SV-10a: Systems and Services Rules Model
 - Operational performance requirements to system performance requirements – impacted by DoD IEA Rules
 - Documents service functionality – service specifications
- SV-8: System Evolution Description
 - Impacts transition plan to NCE – SOA technologies
- SV-9: Systems Technology Forecast
 - New dynamic mechanisms – new SOA technology
- TV-1: Technical Standards Profile
 - DISR – dynamic mechanisms from technology N-c strategies reflected here
- TV-2: Technical Standards Forecast
 - Expected changes in SOA technology
 - Forecast of dynamic mechanism technology



Impact of DoD IEA on DoDAF Products

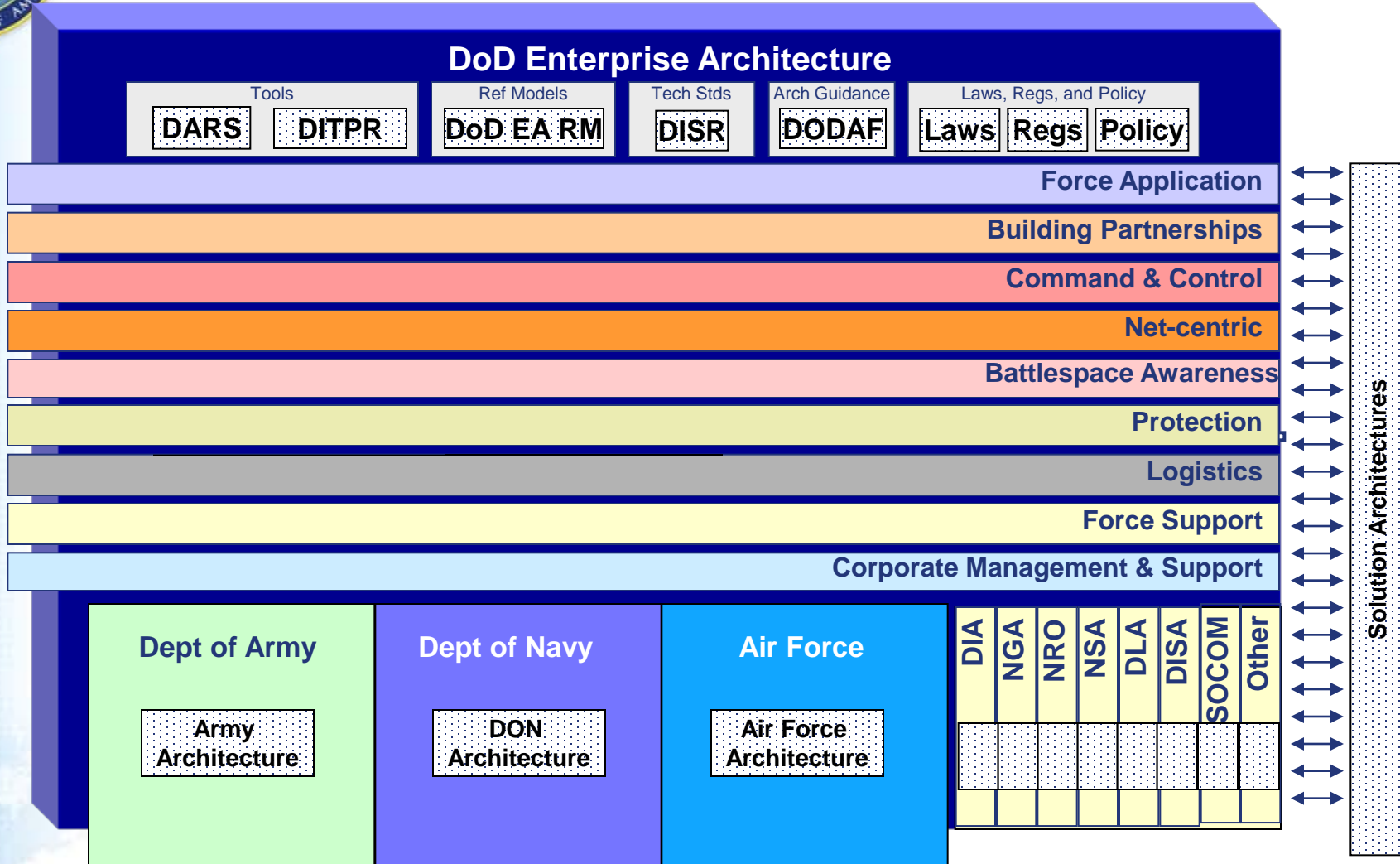
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Core Table Graphic

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Joint Capability Areas



Way Ahead: Enterprise Reference Architecture Cell Proposed Tasks and Products

- Support IT Decision Makers
 - EGB role as CA for Business IT infrastructure
- Assist Components/Programs/Solution Architects as directed
 - Assist in the proper application of the DoD IEA, DoDAF and DARS
- Conduct architecture assessments as directed
 - Assess architecture compliance w/DoD IEA
 - Event Driven - Net Centric Reviews (ED-NCR)
 - JCIDS/DAS Milestone Reviews
- Assist in developing architecture policy and standards

