CIO/NII
Enabling Net-Centric Operations

Assistant Secretary of Defense for Networks and Information Integration/ DoD Chief Information Officer

Overview Presentation

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Enabling Net-Centric Operations

DoD CIO/NII Responsibilities

- Networks and Net-Centric Policies and Concepts
- Enterprise-wide integration of DoD information matters

Principal Staff Assistant

US Title 10
Advise the Secretary

- Command and Control
- Communications and Information Networks
- Network Operations
- RF Spectrum Management
- Position, Navigation, Timing
- Non-Intelligence Space

Chief Information Officer

US Title 40
Manage Information Resources

- Enterprise-level strategist from the information perspective
- Enterprise-wide Information policy
- Information architect for the DoD Enterprise
- DoD-wide information executive

Authorities
- NII Charter (DoDD 5144.1 May 2, 2005)
- Section 113, Title 40, U.S.C., (formerly Clinger-Cohen Act of 1996 as amended)

"I can get the information I need"

When I need it

Where I need it

How I need it

Net-Centric Information Environment

Better Decisions Faster -- Decisive Actions Sooner

Customer Focused – Warfighter #1

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Transforming National Defense – Net-Centric Operations

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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.

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Context for Net-Centric Operations

Challenge – UNCERTAINTY

"UNCERTAINTY is the defining characteristic of today's strategic environment."

(National Defense Strategy)

- Adjust to an era of surprise and uncertainty

Response – AGILITY

"We have set about making US forces more AGILE and more expeditionary."

(Quadrennial Defense Review)

- Enterprise-wide: Battlefield Applications; Defense Operations; Intelligence Functions; Business Processes
- Emphasis Shift: From moving the user to the data – to moving data to the user

Confront Uncertainty with Agility

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CIO Vision and Mission

Vision

Deliver the Power of Information

An agile defense enterprise empowered by access to and sharing of timely and trusted information

Mission

Enable Net-Centric Operations

Lead the Information Age transformation that enhances the Department of Defense's efficiency and effectiveness

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CIO Goal and Outcome

Goal

Information on Demand

- *Build the Net*
- *Populate the Net*
- *Operate the Net*
- *Protect the Net*

Outcome

People, processes, and technology working together to enable timely and trusted:

- *Access to information*
- *Sharing of information, and*
- *Collaboration among those involved*

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Leverage the Power of Information

NET-CENTRICITY:

People, processes, and technology working together to enable timely and trusted:

- **ACCESS** to information
- **SHARING** of information
- **COLLABORATION** among those who need it

Can Only Be Done on The Net!

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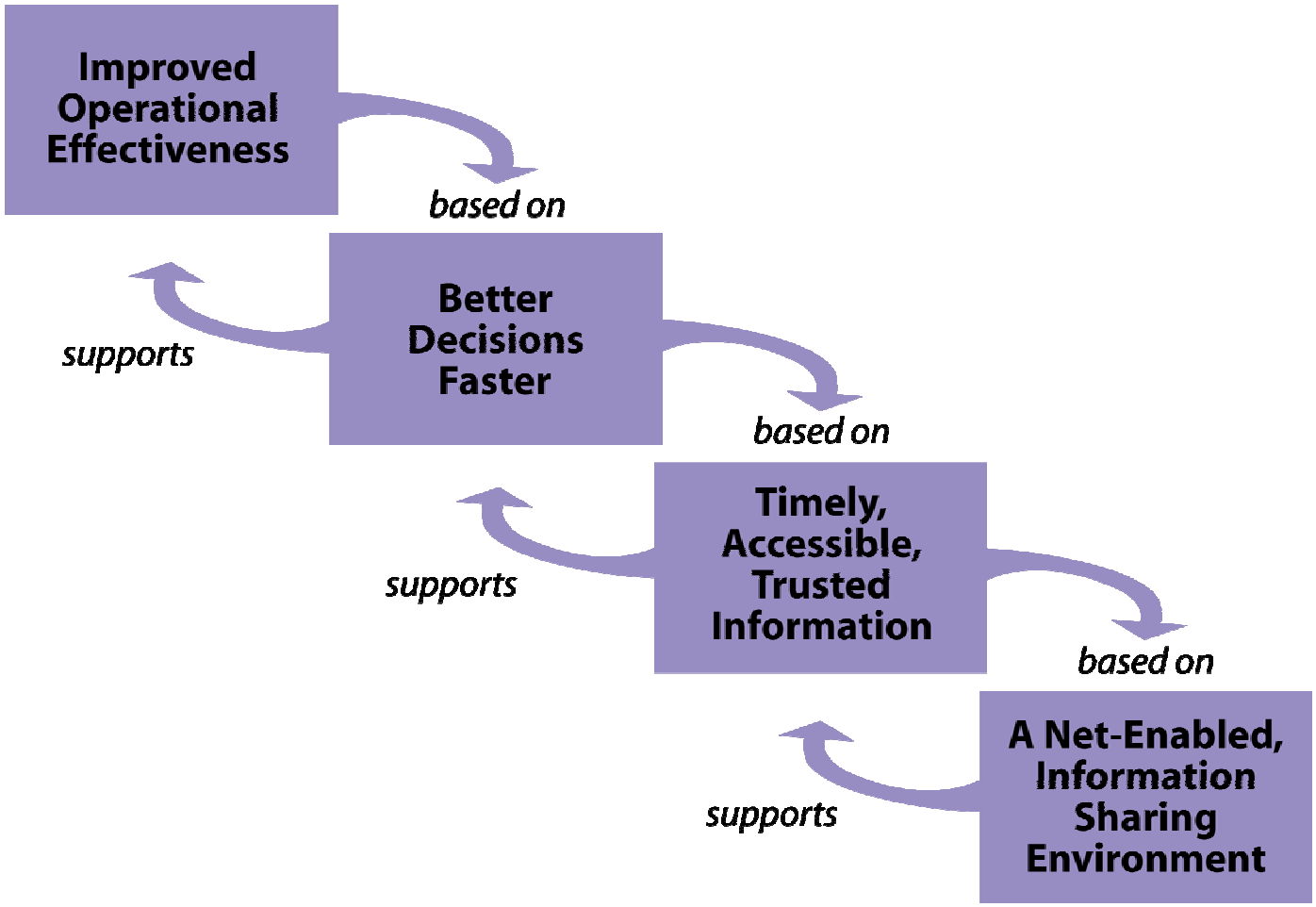
Net-Centric Operations

A Fundamental Shift

- Requires ENTERPRISE, not stovepipes
- Requires ACCESS, not exclusivity
- Requires TRUST
  - Trust in the System (availability)
  - Trust in the Information (assurability)
  - Trust in the Participants (identity)

Our Nation's Security



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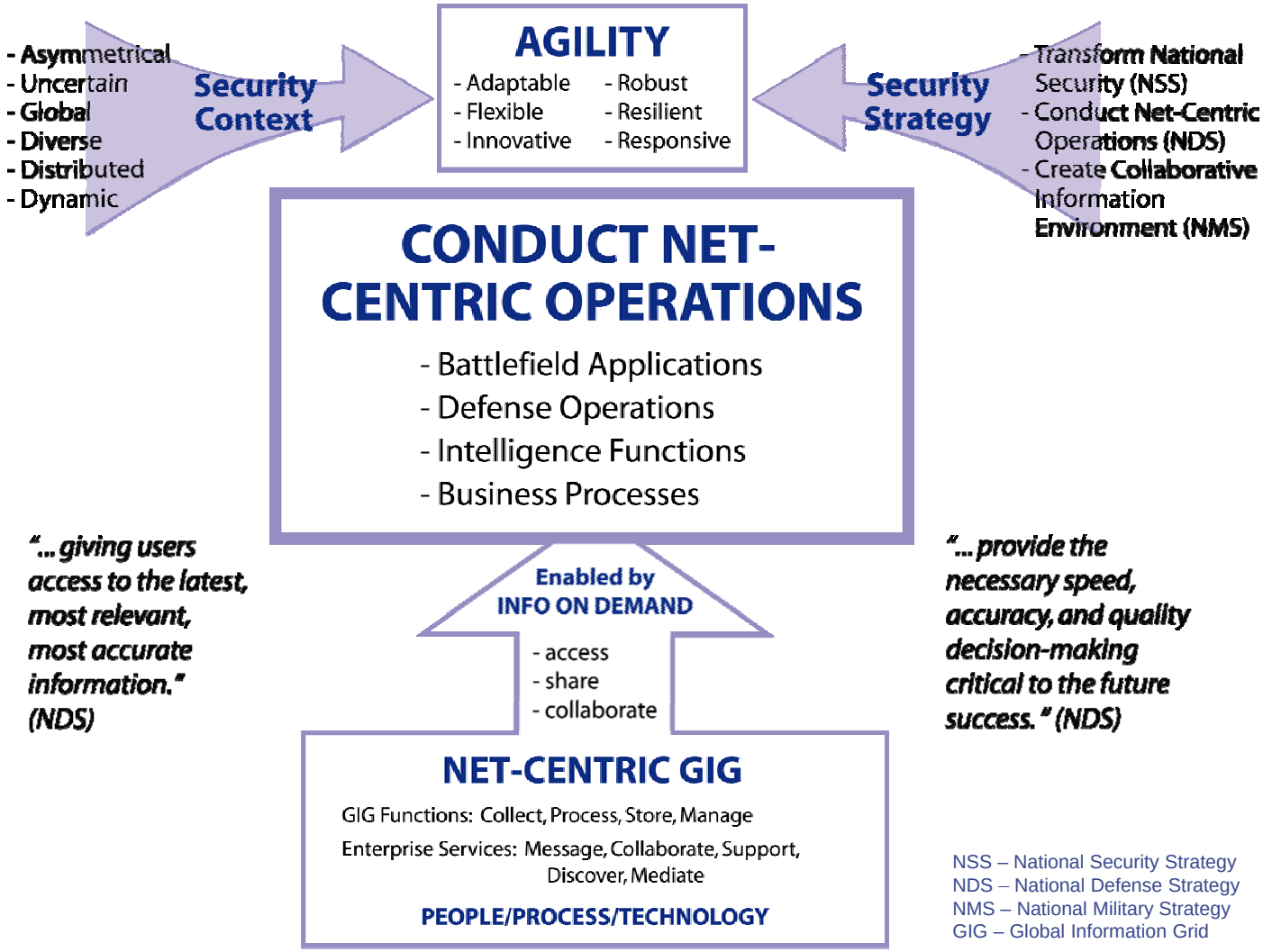
Enabling Net-Centric Operations



NSS – National Security Strategy
NDS – National Defense Strategy
NMS – National Military Strategy
GIG – Global Information Grid

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A Net-Centric Information Environment

Users at all levels and in all situations:

- Accessing the best information available
- Pooling their knowledge
- Making better decisions faster
- Converting decision to actions
- Contributing to our security daily

"Uncertainty is the defining characteristic of today's strategic environment"

National Defense Strategy

"...focus on providing the tip of the spear with the information and actionable knowledge to determine the best course of action..."

MG Peter W. Chiarelli
CG, 1st Cavalry Division

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The Move to Net-Centricity

Current		Net-Centric
Information stovepipes	→	Shared information
"Welded" interfaces	→	Unconstrained
Predetermined needs	→	Unanticipated users
Fixed display formats	→	User-defined info and formats
Need to know	→	Need to share; right to know
Rigid		**Agile**

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Net-Centric Information Environment

Better Decisions Faster -- Decisive Actions Sooner

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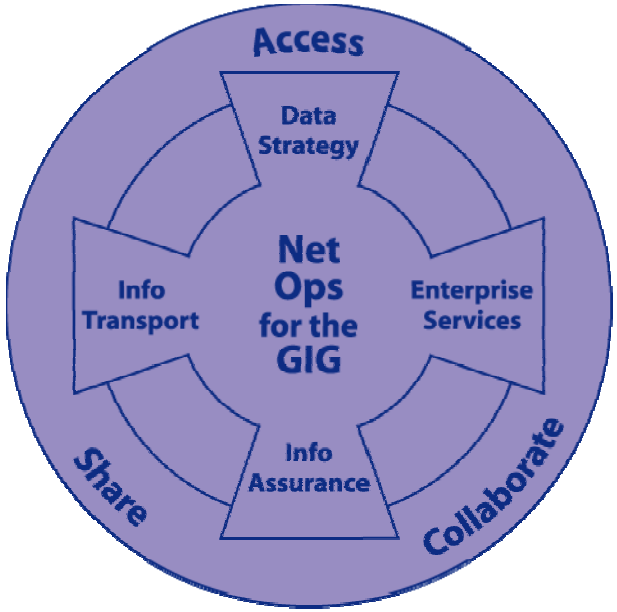
Net-Centric Framework



- **Data Strategy:**
  - *How to "**share**" the data*
- **Enterprise Services:**
  - *How to "**access**" the data*
- **Information Transport:**
  - *How to "**move**" the data*
- **Network Operations:**
  - *How to **"operate and defend"** the GIG*
- **Information Assurance:**
  - *How to keep it all "**dependable**"*

Data: Discoverable, Accessible, Understandable

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Data Strategy

Vision – A flexible and agile Net-Centric, environment of "many-to-many" exchanges and effective decisions

Mission – Implement a data-centric strategy allowing access to and sharing of information

Data Strategy: Foundation

- Ensures **visible, accessible, and understandable** data
- Accelerates decision making by having data where needed and when needed
- Accommodates known and unanticipated users
- "Tags" data (intelligence/non-intelligence; raw/processed) with metadata to enable discovery
- Requires data and services registries to describe, post and store
- Posts data to shared spaces for users to access based on identity and role
- Organizes around Communities of Interest (COIs) using a shared vocabulary to exchange information

Data Strategy

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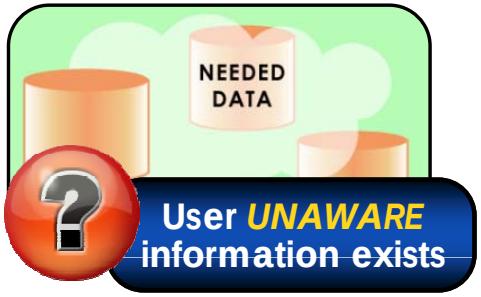
Challenges	Goals	Actions
	**Visible**	• Advertise Information • "Tag" Data
	Accessible	• Web Enable Sources • Remove Impediments • "Need to Share"
	Understandable	• Shared Vocabularies • Communities of Interest

Enterprise Services

Vision – A Service-Oriented Architecture that is open, output focused and independent of location and system-ware

Mission – Establish easy-to-use services to access, share, collaborate

Enterprise Services: Overview

- **Messaging** – Ability to exchange information among users or applications
- **Discovery** – Processes to find information content or services
- **Mediation** – Software to help broker, translate, aggregate, fuse or integrate data/metadata
- **Collaboration** – Allows users to work together and jointly use selected capabilities on the network
- **User Assistant** – Automated “help” capabilities
- **Information Assurance** – Capabilities that provide confidentiality, integrity, availability, authorization, and assurance for information, users, applications, and networks
- **Storage** – Physical and virtual places to host data on the network
- **Application** – Infrastructure to host and organize distributed on-line processing
- **Enterprise Service Management** (ESM) – End-to-end performance monitoring, CM, and problem detection of GIG enterprise services

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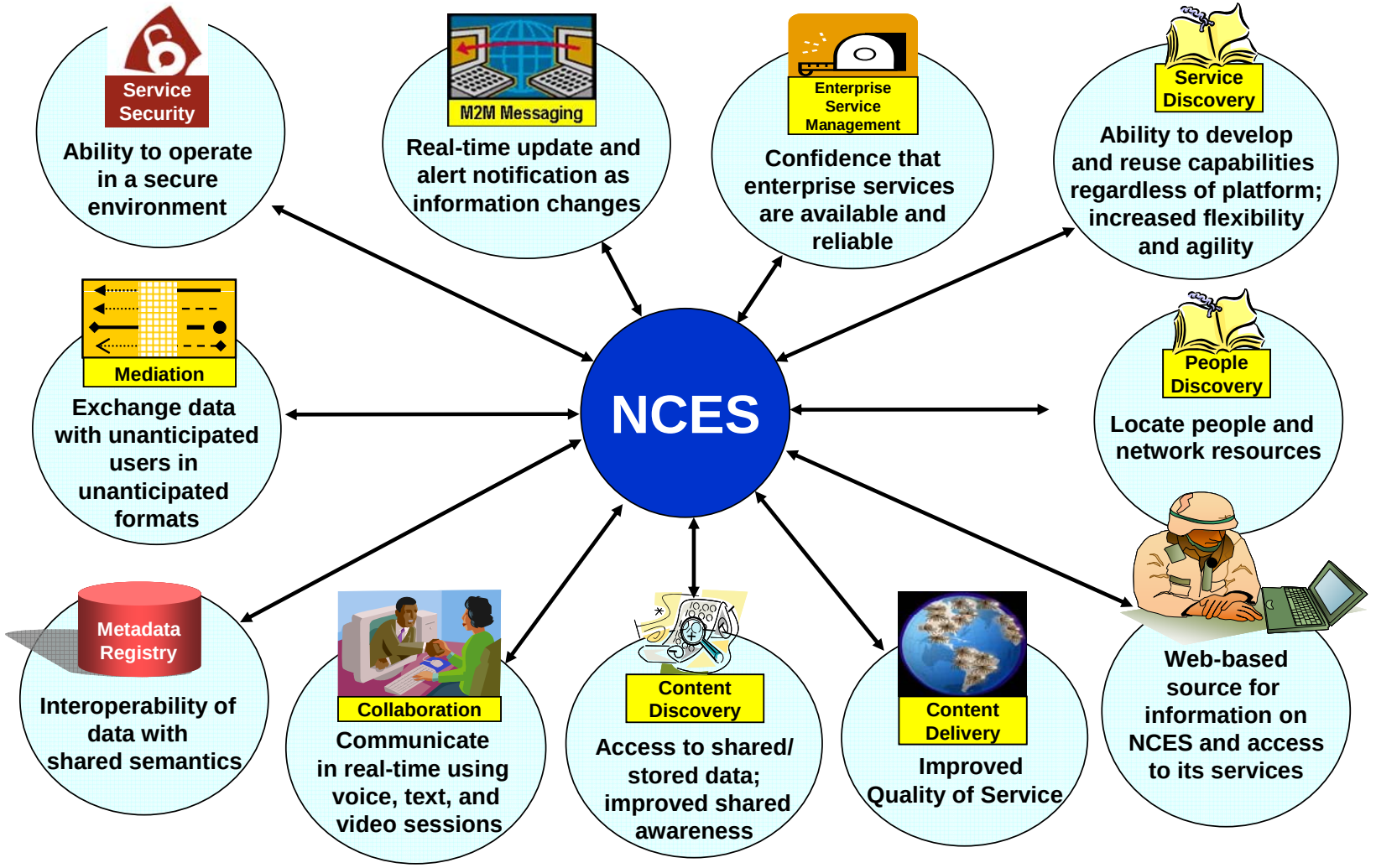
Enterprise Services



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Network Operations

Objective - Ensure the continuous ability to easily access/ manipulate/share any information, from any location, at any time

NetOps: Functions

- **Manage and Assure Operations**
  - Monitor conditions of GIG assets on a continuous basis
  - Make decisions based on conditions and events
  - Direct responses to incidents
- **Govern Enterprise**
  - Set policies, roles and responsibilities for managing operations
  - Determine priorities for operations (i.e., bandwidth allocation, routing, incident response)
  - Establish common processes and standards for operating, monitoring, and responding

NetOps

Net-Enabled Command & Control -- *A Dynamic, Warfighter Focused Capability*

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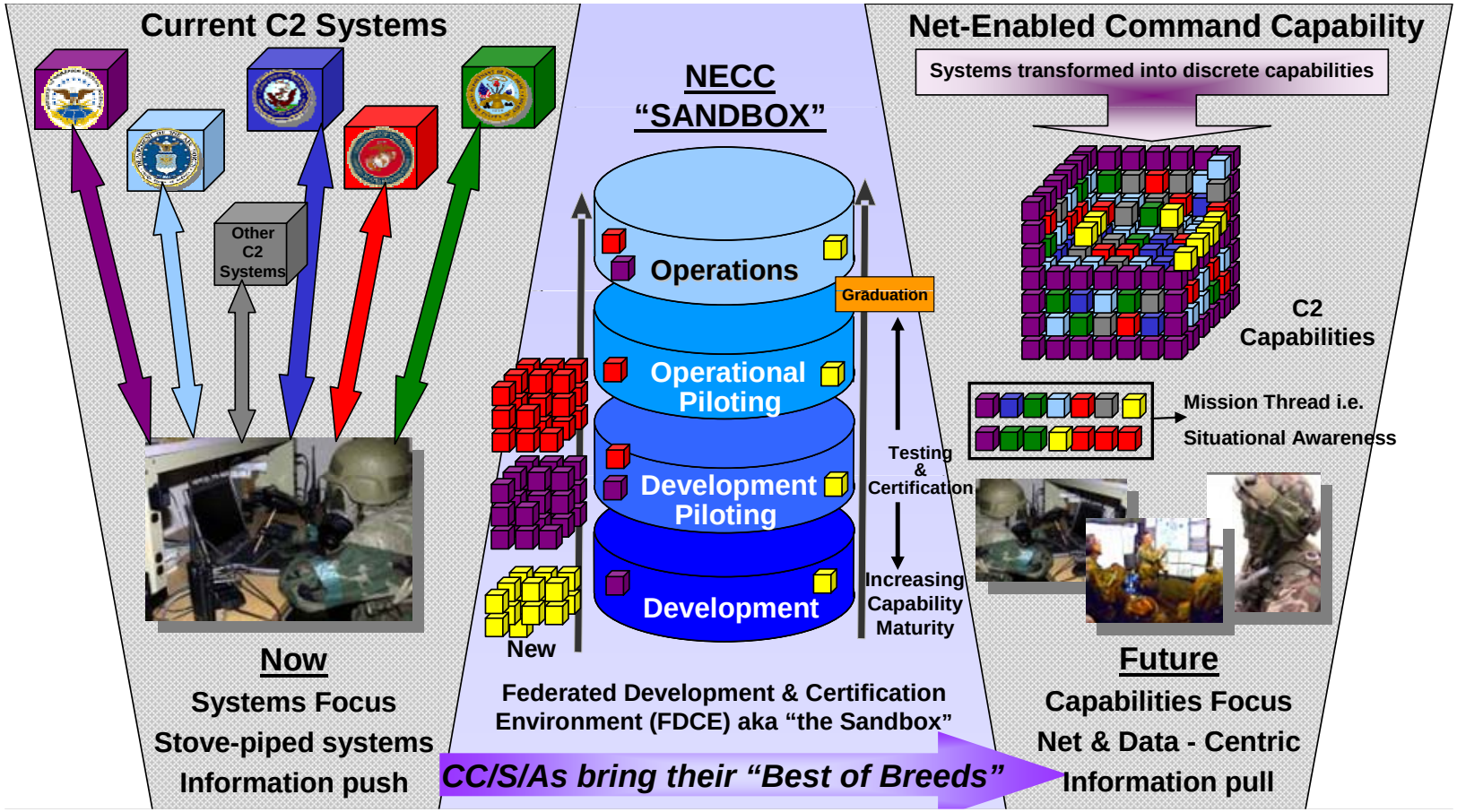

- "Modular" data – increased access
- Built on mission threads
- Unified architecture
- Increased responsiveness

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Information Assurance (IA)

Vision – Dynamic IA in support of Net-Centric Operations

Mission – Assure DoD's information, information systems, and information infrastructure

Information Assurance: Strategy

- **Protect Information**
  - Data protection requirements
  - Protection mechanisms
  - Robust mechanisms
- **Defend Information and Information Environment**
  - Engineer defenses
  - React and respond
  - Assess and evaluate activity
- **Provide Situational Awareness/IA Command and Control**
  - User Defined Operating Picture (UDOP)
  - Coordinate IA ops and decisions
  - Evaluate collaboration
- **Transform and Enable IA Capabilities**
  - Ensure IA integration into programs
  - Dynamic IA capabilities
  - Improve strategic decision-making
  - Information sharing
- **Create an IA Empowered Workforce**
  - Baseline skills
  - Enhance IA skill levels
  - Provide trained/skilled personnel
  - Infuse IA into other disciplines

Information Assurance

Confronting a Persistent Adversary

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- **The Cyber Threat:**
  - **Unconstrained by borders / boundaries**
  - Multiple paths of attack – little / no indications or warning
    - **Huge increases in targeted incidents on the Internet**
- **The Aggressors:**
  - **Responsive to our defensive measures**
  - Elusive, innovative - improving their command & control
    - **Increasingly immune, adaptive, enduring**
- **The Target:**
  - **Information – more valuable / profitable**
  - Personal, business & govt. data/intellectual property at risk
    - **Data theft, identity theft, loss, fraud, and deception**

Information Assurance

Enterprise Security Solutions

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- **Accelerate Network Defense Initiatives**
  - Deploying PKI / CAC, patch management, host-based security
  - We're getting stronger, more responsive, more consistent
- **Cross-Domain Solutions**
  - Aligning policies, processes, governance to drive assured sharing
  - Established DOD/Intel Cross Domain Management Office (CDMO)
- **Certification & Accreditation**
  - Intel and DoD working together to transform / integrate processes
  - Systems fielded in one community authorized to operate in others
- **GIG Info Assurance Initiative (GIAP)**
  - Managing IA as a capability across the enterprise
  - Capability based, focused investment / results
- **Protecting Data At Rest (DAR)**
  - #1 concern among top security issues (2006 FBI survey)
  - DoD formed Tiger Team Aug 2006 to consider options

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Information Transport

Objective - Provide access to and movement of information regardless of time, location, or disposition

Information Transport: Programs

- **Global Information Grid – Bandwidth Expansion** (GIG-BE):
  - Transforms Defense Information System Network (DISN) capabilities (capacity/availability)
  - Connects fixed locations to each other (but does not reach individual users at the tactical edge)
- **Transformational Satellite** (TSAT):
  - Connects mobile groups of users to each other and to fixed locations
  - Extends reach to individual users at the tactical edge
- **Joint Tactical Radio System** (JTRS):
  - Connects individual users within a group of mobile users
  - Provides network entry device for individual users at the tactical edge
- **Teleports**:
  - Provides a gateway between TSAT and GIG BE
- **Spectrum Management**
  - Ensures managed access to the airwaves

Information Transport Technologies

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IPv6

- Supports proliferation of IP-addressed applications/devices, and “comm on the move”
- DoD Transition Strategy: Tech Refresh

VOIP

- Increases flexibility/capacity through broadband Internet connection; allows for converged voice and data on the same network
- DoD Initiatives:
  - Developing standards to end-to-end VOIP capability

Mobile Communications

- Provides network entry device for individual users at the tactical edge
- DoD JTRS Program:
  - Joint Program Office established
  - Form-factors being developed

Satellite Communications

- Enables real time connectivity, high data rate, ISR exfiltration, and comm on the move
- DoD TSAT Program Restructure:
  - IOC 2013; 4 on orbit 2017

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The New Business Model: Implications for Industry

Managed Services and Service Oriented Architecture

CHANGING FROM THIS:		CHANGING TO THIS:
Build a Platform	→	Create an Environment
Buy "Things"	→	Purchase Managed Services
Own It	→	Use It
Application Focused	→	Data Driven
Closed Systems	→	Open Service Oriented Architectures
Proprietary Solutions	→	Common Standards
Stovepipes	→	Enterprise
Pre-Engineered Interfaces	→	Accommodate Unanticipated Users
Info Assurance After-the-Fact	→	Information Assurance Baked-In
Password Access	→	Attribute-Based Access

CONFRONT UNCERTAINTY WITH AGILITY

The Way Ahead…

- **Philosophy**
  - **A**dopt before **B**uy, Buy before **C**reate (**ABC**)
- **Emphasis**
  - Secure, enterprise-level capabilities
  - IP based
  - Web enabled
  - Service Oriented Architecture (SOA)
- **Innovation in technology & services**
  - Continue looking to industry for new approaches

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Scalable, Interoperable, Standards-Based Solutions

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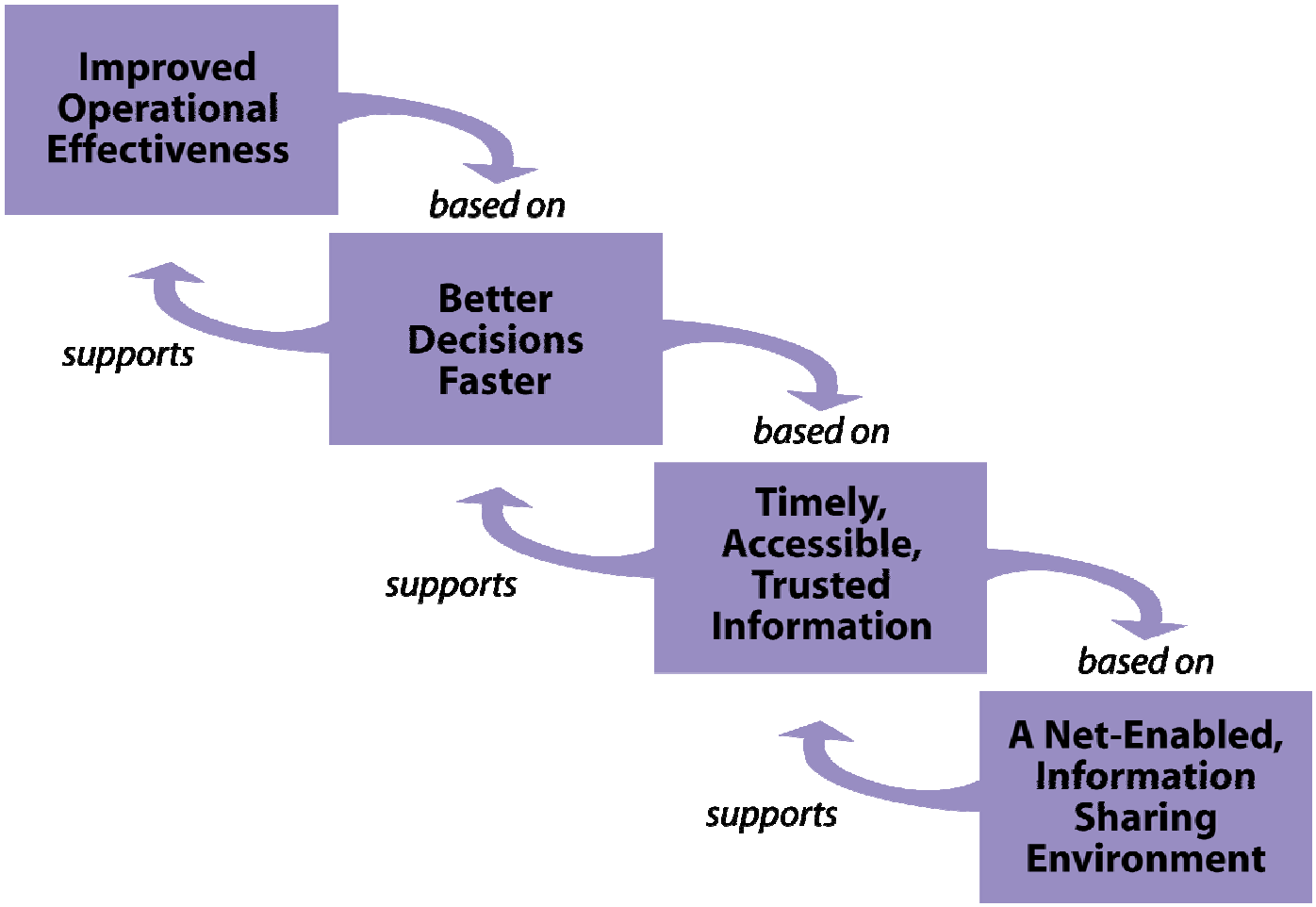
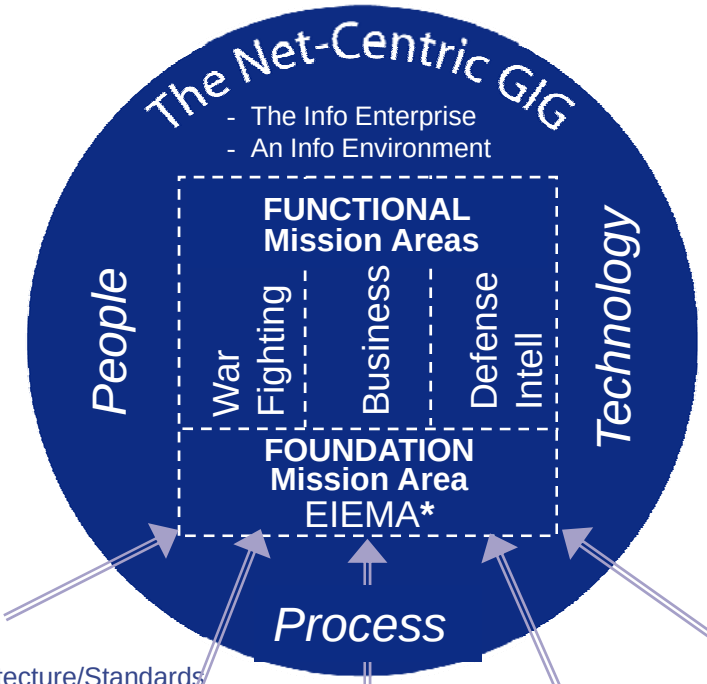


The Net-Centric GIG - Description



***GIG Definition**: The globally interconnected, end-to-end set of information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating and managing **information on demand** to warfighters, policy makers, and support personnel. (DODD 8100.1 September 19, 2002)*

Governance
- Vision/Mission
- Integrated Architecture/Standards
- Data Strategy
- IA Strategy
- Cross-Portfolio Management

Management
- Net Ops
- Maintenance
- Portfolio Management
- Investment Resource Bd

Resources
- Info Transport
- Information Assurance
- Computing Resources
- Service Providers

Services
- Core Enterprise Services
- COI Services

Norms and Standards
- Policy/Directives
- Net-Centric Attributes
- Services Oriented Architecture
- Information Assurance Requirements
- Engineering Specifications
- Implementation Conventions
- NCOW Reference Model

*EIEMA – Enterprise Information Environment Mission Area

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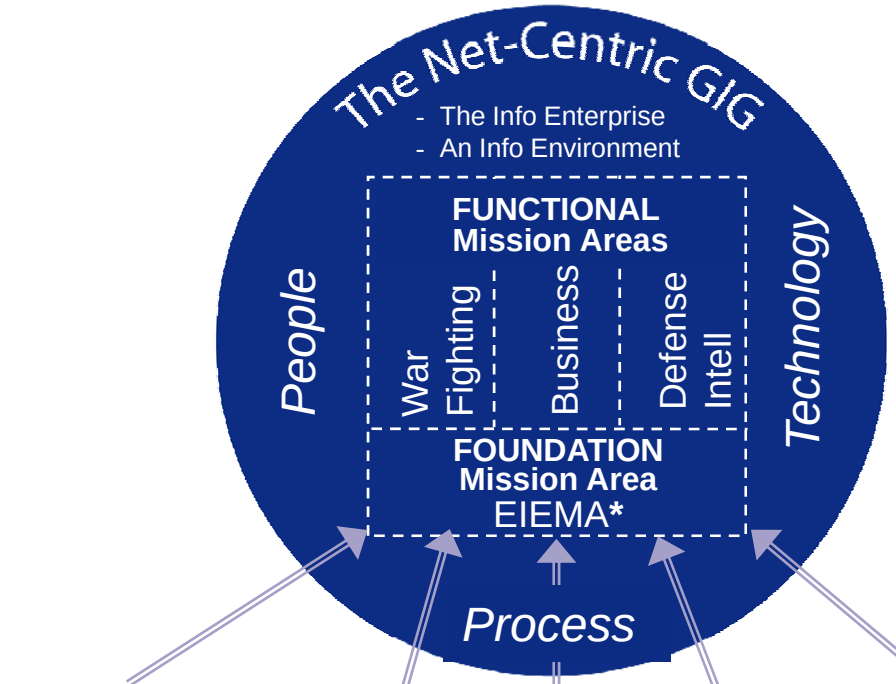
The Net-Centric GIG – Condo Analogy



*EIEMA – Enterprise Information Environment Mission Area

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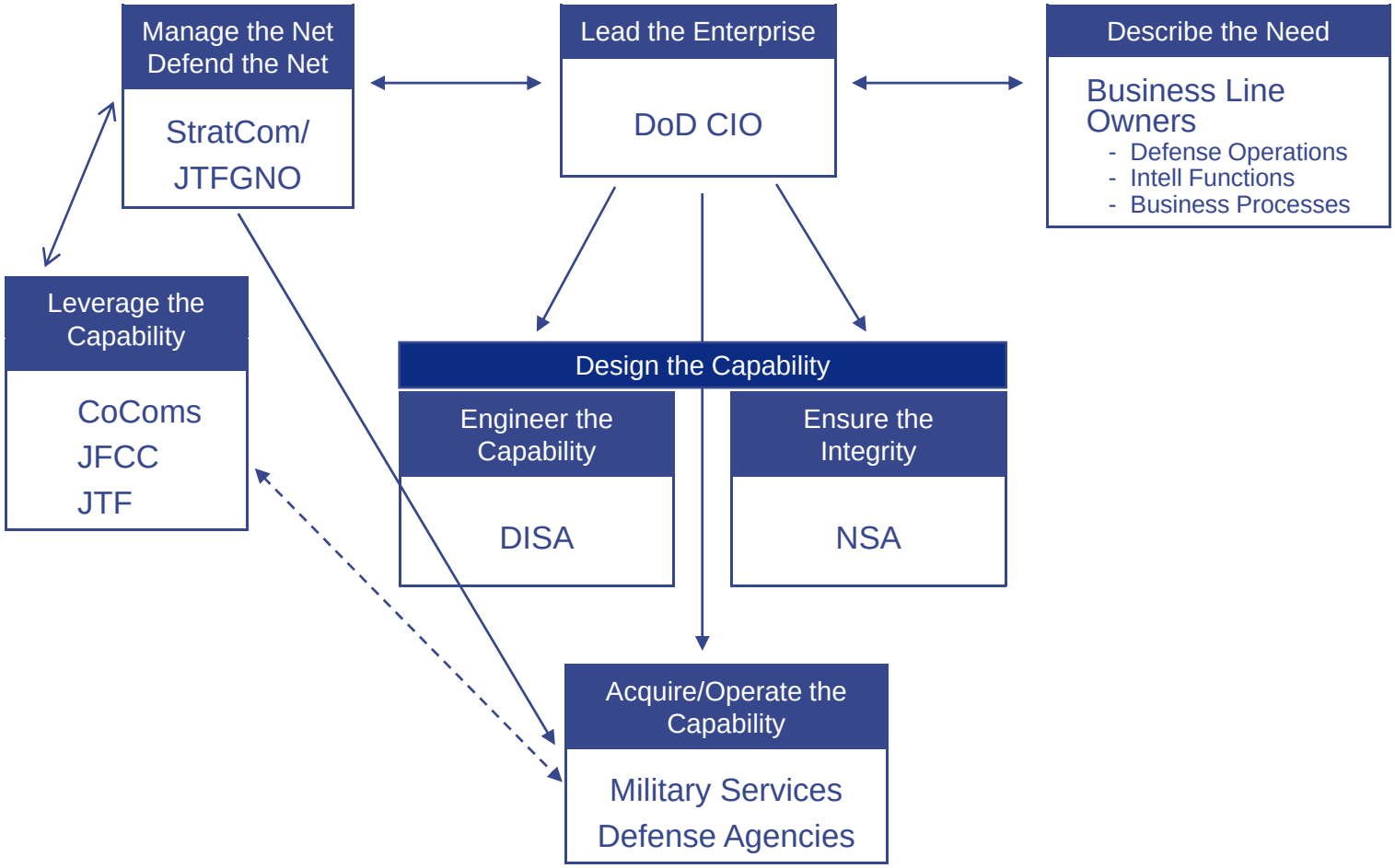
The Information Environment: Roles & Responsibilities



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Achieving Net-Centricity: Terms & Relationships

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