DoD C2: The Current State and Near-Term Challenges

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DoD C2

National Policy

NSPD-17/28, UCP 2006, HSPD-4/5/7, EO 12472, NSPD-51/HSPD-20,

DoD Policy

DoDD 5100.30, DoDD 5144.1, DoDD S-5100.44, DoDD S-5210.81, DoDI 3000.05, DoDD 3020.26, DODD 5105.79

National and DoD Strategy

NSS QDR NDS NMS GDF GEF

Other Guidance

DoD C2 Strategic Plan, DoD Net-Centric Data and Services Strategy, DoD Capability Portfolio Management

NLCC Stakeholders
- **POTUS/VPOTUS**
- **SECDEF**
- **SecState**
- **SecDHS**
- **DNI**

DoD Stakeholders
- **OSD**
- **CJCS**
- **Services**
- **COCOMs**
- **Agencies**
- **JTFs**
- **CPMs**

Non-DoD Stakeholders
- **NGOs**
- **Allies**
- **Coalition Partners**
- **Interagency**
- **State/Local/City/Tribal**

Senior C2 Governance Councils
- **DAWG**

C2 Functional Oversight Committees
- **NLCC EMB**
- **JROC**
- **C2 CIB**
- **3-Star Programmers**
- **DAB/ITAB**

C2 Capability Management Forums
- **C2 SWarF**
- **C2 CIB SSG**
- **C2 CPM**
- **C2 FCB**

DoD Decision Support Processes
- **JCIDS**
- **PPBE**
- **DAS**

ORGANIZE
MONITOR
UNDERSTAND
DIRECT
PLANNING
DECIDE

DoD C2

U.S. Operations and Mission Partners
including, but not limited to:
HD-DSCA, Strategic Deterrence, MCO,
Irregular Warfare, and SSTR operations

Exercise Authority and Direction

C2 Capabilities

National
Strategic
Operational
Tactical

C2 Strategic Plan Objectives
- Provide Capabilities
- Enable Operations
- Maximize Assured Sharing
- Optimize Investments
- Achieve Agile Response

COG/COOP

Joint C2 by COCOM, designated others

Global C2 by NMCS, COCOM designated others

Agencies, Multinational, Coalition, Civil, NGO

Programs of Interest

JOINT	IAMD	Army	Navy	USAF	
GCCS FoS	MDA	MCS	AEGIS	AOC-WS	NAS
DJC2	C2BMC	FBCB2	E-2	JMS	AWACS
JPALS	GEM	CID		BCS-F	
ISPAN	Army IAMD	JBC-P	USMC	MPS	
		IBCS	CAC2S		

Net-Centric Environment

Global Information Grid

Command and control is defined as the ability to exercise authority and direction by a properly designated commander or decision-maker over assigned and attached forces and resources in the accomplishment of the mission. (C2 Strategic Plan)

Future Capabilities must be interoperable, timely, accessible Complete, secure, accurate, simple and relevant (C2 Strategic Plan)

How we see the Challenge for Command and Control

- **Ultimately a Human Endeavor**
  - Technology enables the human interface and supports "command" and the decision maker, rather than forcing the decision maker to operate within the constraints of the "control" technology

- **Information Age Makes it…**
  - More Important and More Challenging….with Great Opportunity

- **Must Support the Way We Fight**
  - Joint, Allies and Coalition
  - Requires Trust

- **Must Work Enterprise Solutions**
  - Processes for Collaboration and Consensus Building
  - Promote Improved Information Sharing Among Mission Partners

DoD C2 Strategic Plan
DepSecDef Approved Jan 12, 2009

- **Purpose**
  - Provide strategic direction and policy guidance for the Department to effectively define, prioritize, acquire, govern, manage, and implement C2 capabilities in support of DoD operations
  - Provide guidance for implementation planning that will result in the DoD C2 Implementation Plan
- **Goals**
  - Synchronized C2 capability delivery and integration with capabilities from other portfolios
  - Provide an approach to manage operational risk during the transition from current to follow-on C2 capabilities
  - Enable effective governance via extant decision support processes and governance authorities in accordance with Department priorities
  - Support the development and execution of implementation activities to satisfy DoD C2 capability needs

DoD C2 Strategic Plan
DepSecDef Approved Jan 12, 2009

- **Objectives**
  - Provide the capabilities necessary to effectively support organizing command structures and forces, understand situations, plan and decide upon courses of action, and direct and monitor execution across the range of DoD operations
  - Enable military forces and mission partners to conduct integrated operations across the range of DoD operations at all echelons of command
  - Maximize assured sharing of information and services and synchronized implementation of collaborative C2 capabilities
  - Optimize C2 capability investments across the range of DoD operations
  - Achieve agile and responsive development, acquisition, fielding, and sustainment of C2 capabilities across the DOTMLPF spectrum

Key C2 Initiatives

- **Data Strategy Implementation for C2**
  - Identify and exposure Authoritative Data Sources (ADS)
  - Publish in a common format to support flexible implementation
  - Develop a common data exchange standard (C2 Core) as an extension from Universal Core (non-proprietary, open source)

- **Services Strategy Implementation for C2**
  - Maximize Use of Mandated Core and Shared Enterprise Services
  - Identify C2 Common, Regional and Local Services

- **Joint Mission Threads**
  - An essential element to understand the context of how we C2

- **Joint C2 Capability Development**
  - Intent is to sustain and synchronize current C2 capabilities
  - Incremental vice evolutionary delivery of capability

Net-Centric Data Strategy

CURRENT INFORMATION SHARING CHALLENGES

IMPLEMENTATION APPROACHES

User UNAWARE information exists

Visible →

Advertise Information Holdings ("Tag" Data)

ADS*

User knows it exists, but CANNOT ACCESS IT

Accessible →

Web Enable Sources Provide assured access Remove Impediments — "Need to Share"

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

Understandable →

Vocabularies shared between Communities of Interest

C2 Core

User can access data, but can it be TRUSTED

Trusted →

Assess data sources, Associate trust discovery metadata (secure tagging)

* ADS: Authoritative Data Source

Status and Challenges of ADS Exposure

- **The C2 community has agreed on an approach and timeline to make data visible and accessible**

- **Emphasis is on 232 ADS (Data Assets) supporting 700+ information needs**
  - Data principally resides in Service and Agency programs and systems
  - Goal is to have at least 80% exposed by end of FY14

- **Making data visible and accessible is a deceivingly complex challenge:**
  - Difficulties accessing and integrating diverse sources of information
  - Diverse standards among new and legacy systems
  - Cultural change from "need to know" to "need to share"

C2 Core Development

- **C2 Core is designed to facilitate *interoperability* through the use and re-use of schema components and vocabularies for machine-to-machine (M2M) data exchanges in C2 domain**
- **C2 Core will:**
  - Provide a set of **reusable data components** agreed on by the C2 Community providing semantics for information exchange
  - Provide a **standard architectural framework** for information exchange
  - With Universal Core, provide a base level of data interoperability
- **Intent is to enable data *interoperability* and *understanding* across the Department and with external mission partners**
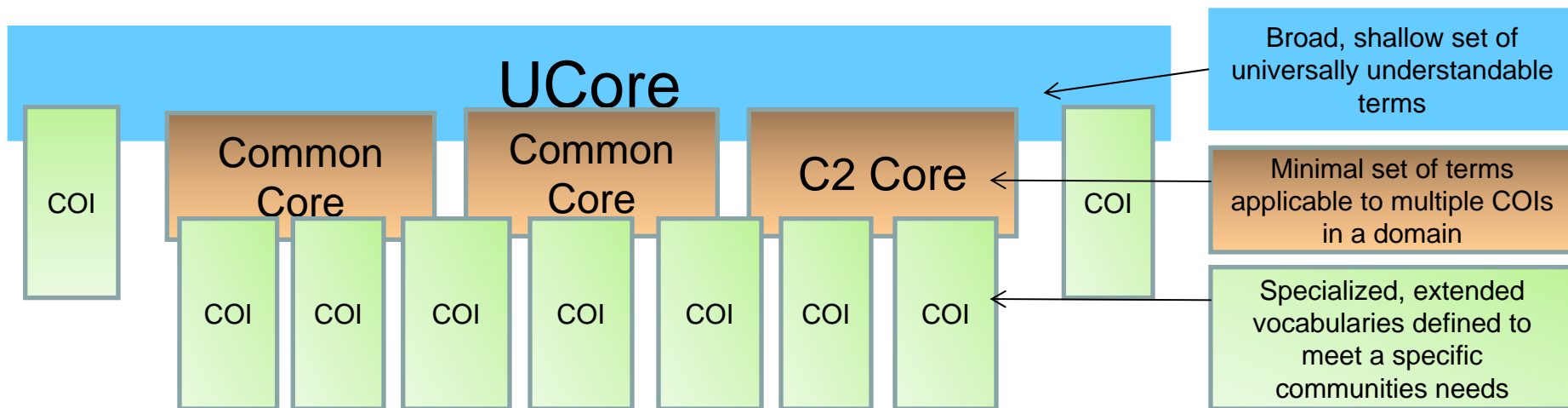
Why C2 Core?

- **Communities of Interest (COI) define/structure like data elements differently**
  - Tank = liquid container or Tank = Armored vehicle
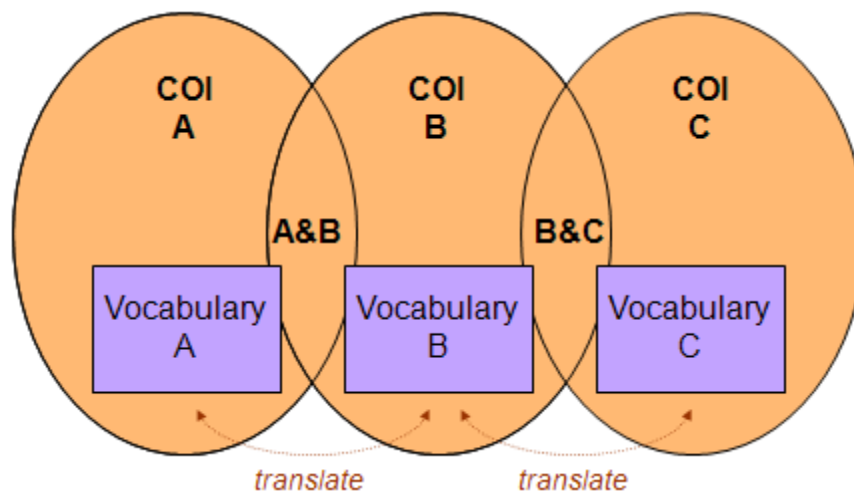
- **C2 information exchanges suffer because of the need to draw on these disparate data elements in support of the Commander's needs**

Why C2 Core?

UCore

Common Core

Common Core

C2 Core

COI

COI COI COI COI COI COI COI

Broad, shallow set of universally understandable terms

Minimal set of terms applicable to multiple COIs in a domain

Specialized, extended vocabularies defined to meet a specific communities needs

- **C2 Core simplifies C2 information exchanges through agreement on:**
  - Data element definitions common to many COIs
  - Technical structure of Information Exchange Specifications (IES) supporting C2 information needs
  - Leverages Universal Core (UCore) through extension of its Who, What, When and Where (4W) elements

C2 Core Status and Plans

- ✓ **Phase 0: Analysis and Preparation: Complete**
- ✓ **Phase 1: Development and Evaluation: Complete**
- • **Phase 2: Content Development: On-going**
  - ✓ Spiral 1 released 21 Dec 09
  - ✓ Spiral 2 released 31 Mar 10
  - – Spiral 3 due 30 Jun 10 – Development/Feedback
  - – Major Milestone: Spiral 4/v1.0 due 30 Sep 10
- • **Phase 3: Maturation**
  - – Identification of C2 Core Piloting opportunities – 1 Jun 10
  - – C2 Core pilots throughout FY11
  - – Revision of C2 Core to produce v2.0; projected release 30 Sep 10
- • **Phase 4: Implementation**
  - – Expected to begin in FY12

Net-Centric Services Strategy

Key Value Propositions ➡️

**Agility
Improved Information Sharing**

NCSS Goals

- Provide Services
- Use Services
- Govern the Infrastructure and Services
- Monitor and Manage Services via GIG NetOps

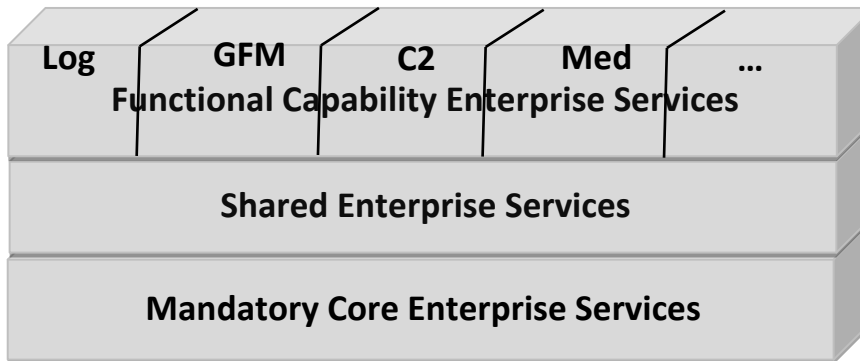## NCSS Key Actions

✓ **Enable producers and consumers to use, share, discover and access services:**

- **Register services for discovery and use**
- **Use consistent methods for describing services**
- **Promote trust through service level guarantees and access control mechanisms**

✓ **Operationalize the SOE: (Web-based Services and SOAs)**

- **Extend infrastructure through federation**
- **Implement service monitoring, including user feedback at all levels**
- **Establish appropriate roles, responsibilities across the services lifecycle and for portfolio management**
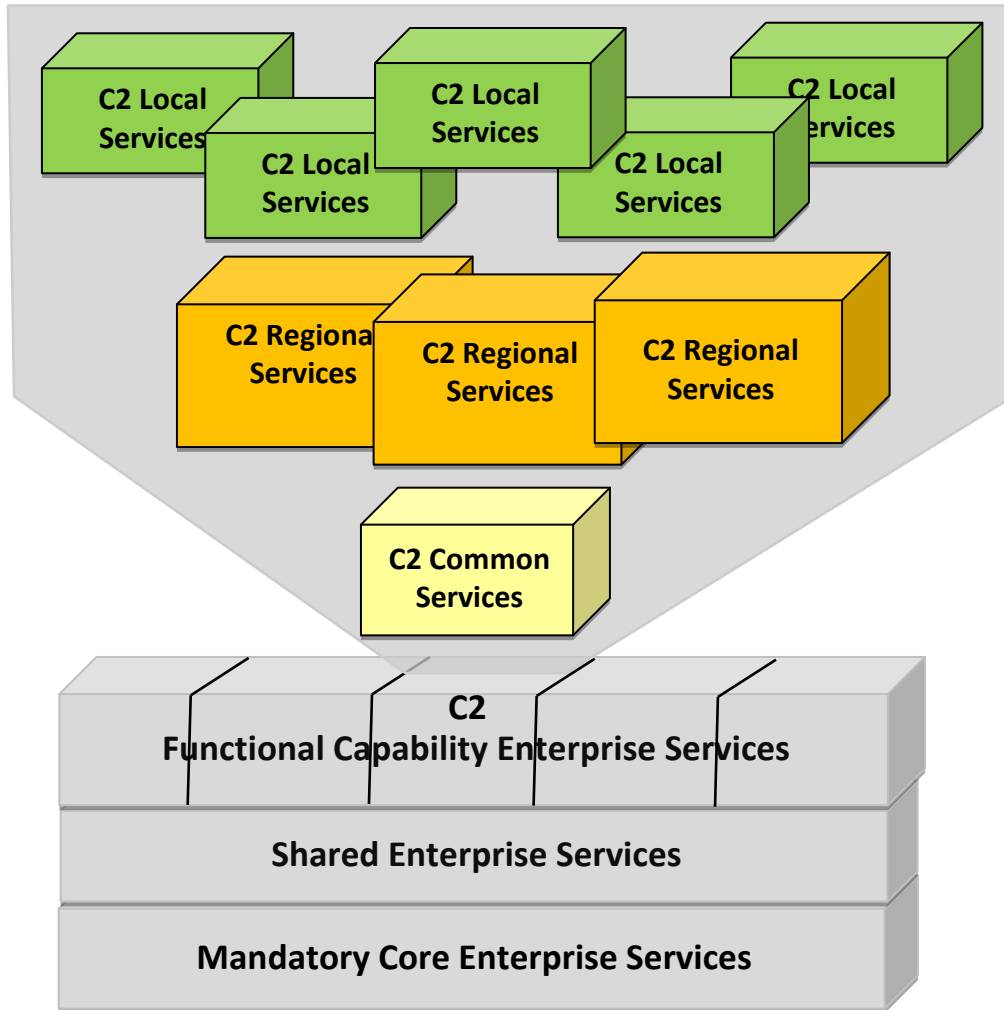
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Enterprise Services

Log   GFM   C2   Med   ...
Functional Capability Enterprise Services

Shared Enterprise Services

Mandatory Core Enterprise Services

**DRAFT
DoD Instruction
"Enterprise Service
Designation,
Sustainment and
Termination."**

C2 Functional Capability ES

Tier 3
Tier 2
Tier 1

C2 Local Services
C2 Local Services
C2 Local Services
C2 Local Services
C2 Local Services
C2 Local Services

C2 Regional Services
C2 Regional Services
C2 Regional Services

C2 Common Services

C2 Functional Capability Enterprise Services

Shared Enterprise Services

Mandatory Core Enterprise Services

**DRAFT
DOD Instruction
"Functional
Capability Services
for Command
and Control (C2)"**

**DRAFT
DoD Instruction
"Enterprise Service
Designation,
Sustainment and
Termination."**

Joint Mission Threads

- **Joint Mission Thread (JMT): an operational and technical description of the end-to-end set of activities and systems that accomplish the execution of a *joint mission***

- **Provides the Context of C2 activities and needs**
  - Tier 1 comprises overall systems, information exchanges, activities performed, nodes, need-lines, and actors
  - Tier 2 "strands" represent of detailed breakdowns, with supporting reusable data
  - Tier 3 is a conceptual and organizational construct to address specific testing and certification requirements as they emerge

Joint Mission Threads

- **Joint Mission Threads (JMTs) help us to understand:**
    - Interoperability issues
    - Capability gaps
- **JMTs can be used for:**
    - Interoperability Testing and Evaluation (T&E)
    - Training Exercises and mission rehearsals
- **Analysis of Joint Close Air Support JMT identified:**
    - Gaps in procedures – Services had different joint request procedures
    - Joint Terminal Attack Controllers had very different digital implementations (message formats, wave forms)
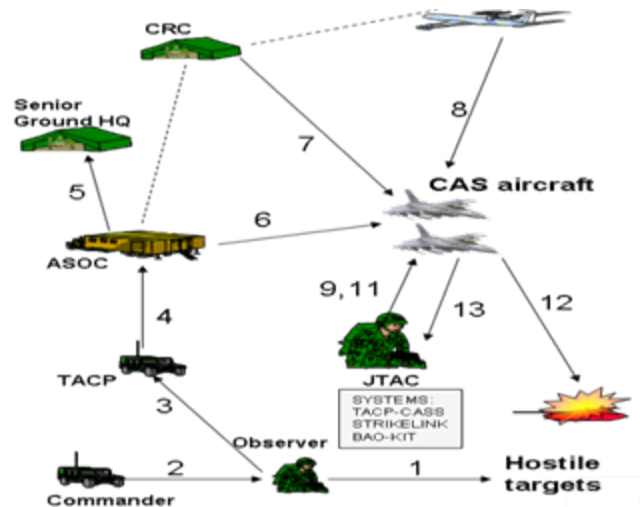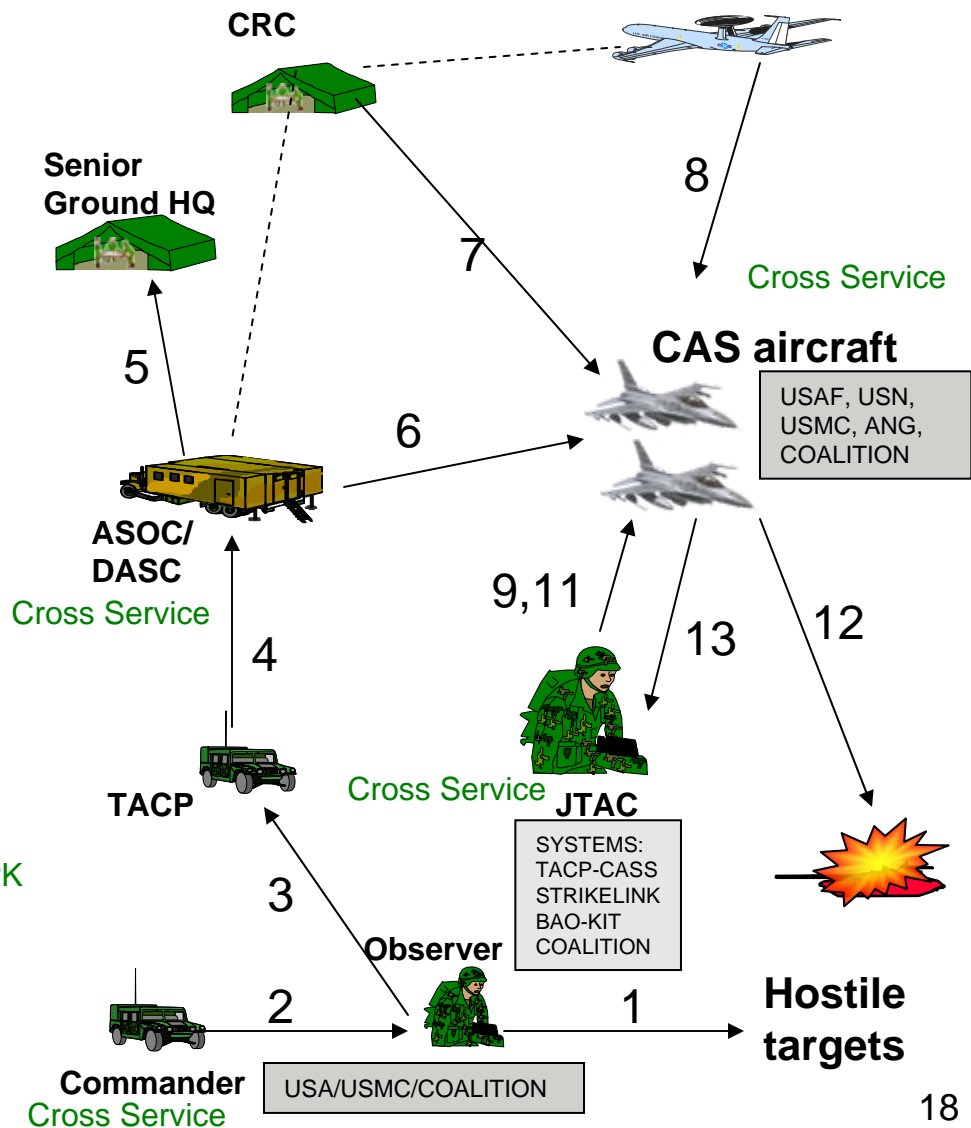
Representative Sample
Joint Close Air Support

Mission Event No.	Description	
1	Unit detects target	
2	Commander decides to request CAS	
3	Unit notified TACP	< 5 min
4	TACP passes request to ASOC	
5	ASOC coordinates with senior ground HQs which approve request	
6	ASOC assigns on-call aircraft	
7	CRC send aircraft to contact point (CP)	> 95% Acrcy
8	AWACS passes critical updates to aircraft	
9	JTAC briefs aircraft	
10	Aircraft depart initial point (IP)	> 98.9 % PK
11	JTAC controls CAS aircraft	
12	Bombs on target	
13	Assessment	

CRC

Senior Ground HQ

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Cross Service

CAS aircraft

USAF, USN, USMC, ANG, COALITION

7

5

6

ASOC/ DASC
Cross Service

9,11

13

12

4

TACP

Cross Service

JTAC

SYSTEMS: TACP-CASS STRIKELINK BAO-KIT COALITION

3

Observer

Hostile targets

2

1

Commander
Cross Service

USA/USMC/COALITION

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JMT Development Efforts in FY10

| 10 | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | 11 |

Joint Close Air Support (JCAS)
▲ deliver Block 1 T&E plans to SVCs
Tier 3

(JCAS JMT work is transitioning findings to fielded capability)

Joint Personnel Recovery (JPR)
▲ Begin Arch update
Tier 3

CIED
JFCOM team Assigned ▲
Measures delivered ▲
As-Is JMT Arch ▲

IAMD
JIAMDO JMT ▲ Review Begins
IAMD Architecture Task ▲ Force/Focus Group Rev Draft JMTs
▲ Deliver 3 Draft JIAMDO JMTs
▲ ▲ ATF/FG mtg to finalize JMTs
Deliver Remaining Draft JIAMDO JMTs
▲ Begin formal staffing

GFM
▲ Analytics
▲ Force Generation Models
▲ Execution Models
▲ Stakeholder Rvw

EW / EA
EWSA Consolidation WS ▲
AEA Consolidation WS ▲
▲ EW JMT Scoping WS
Joint EW Consolidation WS ▲

In Tier 1 Development

GFM: Global Force Management

EW: Electronic Warfare Electronic Attack

C-IED: Counter Improvised Explosive Device

IAMD: Integrated Air Missile Defense

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Joint C2 Capability

NECC

- One big Acquisition Program

- Replicate GCCS Family, then replace

- Most capability delivered at end of program

- Big, multi-year Increments

Joint C2 Capability

- Family of smaller, more agile programs

- Evolve <u>from</u> the GCCS Family of Systems

- *Rapid* delivery of capability to warfighter incrementally

- Multiple *smaller, annual* increments

223 Capability Needs identified in NECC remain valid & stable

NECC: Net-Enabled Command Capability   GCCS: Global Command and Control System

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Summary

- **C2 Data Strategy**
  – Required to improve information sharing and achieve greater levels of interoperability
  – Allow access to understandable, authoritative data, on demand

- **C2 Services Strategy**
  – Essential for more flexible and agile delivery of C2 capabilities

- **Joint Mission Threads will provide operational context**
  – Represent the standard processes and needs to execute a mission - aids in identification of C2 gaps

- **Future needs will be met evolving from the GCCS Family of Systems**
  – Goal is more rapid fielding in smaller increments of capability
  – Warfighter needs will shape the priority of fielding

Questions and Discussion

JOINT
GCCS FoS-Global Command and Control Family of Systems
NECC-Net Enabled Command Capability
DJC2-Deployable Joint Command and Control
JPALS-Joint Precision Approach and Landing System
SPAN-Security Policy Automation Network
CCIC2S-Combatant Commanders Integrated Command and Control
IAMD-Integrated Air and Missile Defense
MDA-Missile Defense Agency
C2BMC-Command and Control Battle Management and Communications
GEM-Guidance Enhanced Missile
JIAMDO-Joint Integrated Air and Missile Defense Organization
JAMD-Joint Air and Missile Defense
ARMY
MCS-Mounted Combat System
FBCB2-Force XXI Battle Command, Brigade-and-Below
CID-Combat Identification
JBC-P-Joint Battle Command - Platform
JBFSA-Joint Blue Force Situational Awareness
IBCS-Integrated Battlefield Control System
USN
AEGIS-Advanced Electronic Guidance and Instrumentation System
E-2-Hawkeye; Navy Airborne Warning and Control System Aircraft
USMC
CAC2S-Common Aviation Command and Control System
USAF
AOC-WS-Air Operations Center-Work Station
SPACE C2-Space Command and Control
BCS-F-Battle Control System-Fixed
BCS-M-Battle Control System-Mobile
MPS-Mission Planning Station
NAS-National Aerospace System
AWACS-Airborne Warning and Control System

JOINT
POTUS/VPOTUS-President/VP of the United States
SECDEF-Secretary Of Defense
SecState-Secretary of State
SecDHS-Secretary of Homeland Defense
DNI-Director of National Intelligence
OSD-Office of the Secretary of Defense
CJCS-Chairman of the Joint Chiefs of Staff
COCOMs-Combatant Commands
JTFs-Joint Task Forces
CPMs-Capability Portfolio Managers
COG- Continuity of Government
COOP-Continuity of Operations Plan
NGOs-Non-government agencies
DAWG-Deputy's Advisory Working Group
NLCC EMB-National Leadership Command Capability Executive Management Board
JROC-Joint Requirements Council
C2 CIB-C2 Capability Integration Board
 3-Star Programmers
 DAB/ITAB- Defense Acquisition Board / Information Technology Advisory Board
C2 SWarF-C2 Senior Warfighters Forum
C2 CIB SSG-Capability Integration Board Senior Steering Group
C2 CPM—Capability Portfolio Manager
C2 FCB—Functional Control Board
JCIDS--Joint Capabilities Integration and Development System
PPBE--Planning Programming Budgeting and Execution
DAS--Defense Acquisition System
HD DSCA--Homeland Defense-Defense Support of Civil Authorities
MCO--Major Combat Operations
SSTR--Stability, Security, Transition and Reconstruction

- **Purpose: Delineate execution responsibilities and implementation activities necessary to achieve DoD C2 capability objectives**

- **Is an executable plan that:**
  - Promotes DoD-wide unity of effort in executing the DoD C2 Strategic Plan
  - Supports OSD planning efforts regarding C2 capabilities and programs
  - Identifies required DoD-wide C2 DOT_LPF initiatives and programs to complement ongoing and new C2 material acquisition programs

Authoritative Data Sources

- **Fundamental Tenet of the DoD Net-Centric Data Strategy requires data be:**
  - Visible
  - Accessible
  - Understandable (Interoperable)
  - Trusted

- **Identification of Authoritative Data Sources and the exposure support the *visible* and *accessible* aspects**

An ADS is defined as:

A recognized or official data production source with a designated mission statement or source/product to publish reliable and accurate data for subsequent use by customers. An authoritative data source may be the functional combination of multiple, separate data sources.