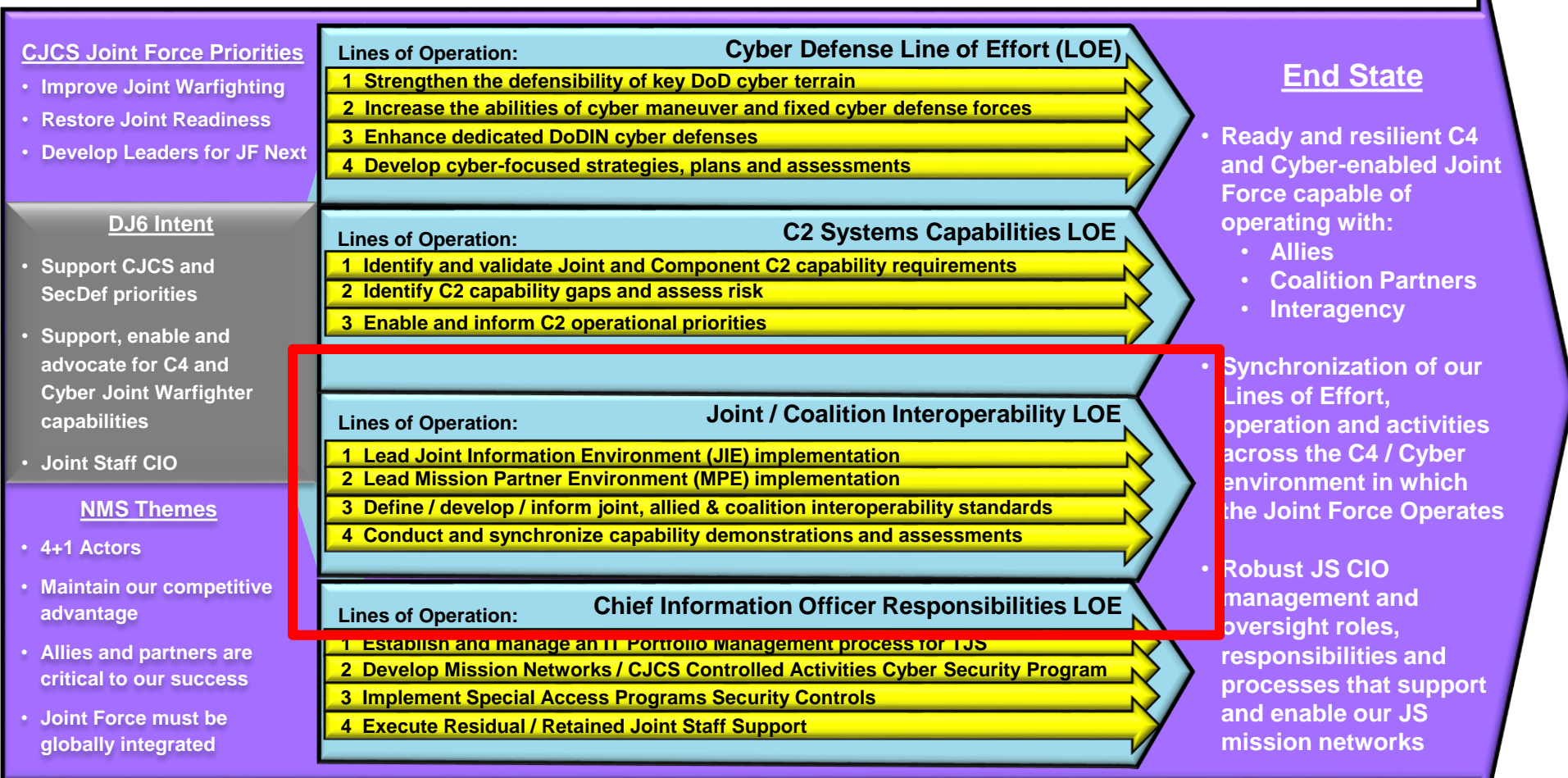**U.S. Joint Staff J6**
Deputy Directorate
for
Cyber and C4 Integration
(DD C5I)

Enhancing Joint and Coalition Interoperability

25 October 2017

Scott Shephard
Coalition Interoperability Division

J6 Strategic Direction

Joint Staff J6 will assist CJCS in providing best military advice while advancing cyber defense, C2 systems capabilities, and Joint and Coalition interoperability required by Joint Force to preserve nation's security

CJCS Joint Force Priorities
- Improve Joint Warfighting
- Restore Joint Readiness
- Develop Leaders for JF Next

DJ6 Intent
- Support CJCS and SecDef priorities
- Support, enable and advocate for C4 and Cyber Joint Warfighter capabilities
- Joint Staff CIO

NMS Themes
- 4+1 Actors
- Maintain our competitive advantage
- Allies and partners are critical to our success
- Joint Force must be globally integrated

Cyber Defense Line of Effort (LOE)
Lines of Operation:
1. Strengthen the defensibility of key DoD cyber terrain
2. Increase the abilities of cyber maneuver and fixed cyber defense forces
3. Enhance dedicated DoDIN cyber defenses
4. Develop cyber-focused strategies, plans and assessments

C2 Systems Capabilities LOE
Lines of Operation:
1. Identify and validate Joint and Component C2 capability requirements
2. Identify C2 capability gaps and assess risk
3. Enable and inform C2 operational priorities

Joint / Coalition Interoperability LOE
Lines of Operation:
1. Lead Joint Information Environment (JIE) implementation
2. Lead Mission Partner Environment (MPE) implementation
3. Define / develop / inform joint, allied & coalition interoperability standards
4. Conduct and synchronize capability demonstrations and assessments

Chief Information Officer Responsibilities LOE
Lines of Operation:
1. Establish and manage an IT Portfolio Management process for TJS
2. Develop Mission Networks / CJCS Controlled Activities Cyber Security Program
3. Implement Special Access Programs Security Controls
4. Execute Residual / Retained Joint Staff Support

End State
- Ready and resilient C4 and Cyber-enabled Joint Force capable of operating with:
  - Allies
  - Coalition Partners
  - Interagency

- Synchronization of our Lines of Effort, operation and activities across the C4 / Cyber environment in which the Joint Force Operates

- Robust JS CIO management and oversight roles, responsibilities and processes that support and enable our JS mission networks

"Wildly Important Goals"

Achieve Globally Integrated Capabilities

Develop Mature, Integrated Cyber Capabilities

Achieve Operational Interoperability

Achieve Sustained Coalition Interoperability Assurance and Validation (CIAV) in support of CCMDs

Note: All goals inclusive of Joint, Inter-Agency and Coalition partners
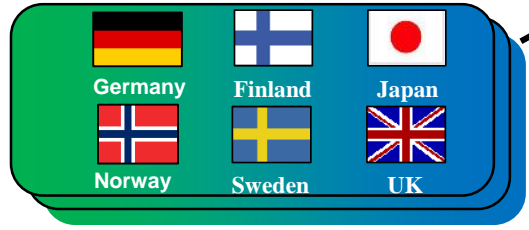
Interdependencies

NATO

**C3 Board / US Mission
Allied Command Transformation
C2 COE, M&S COE, NCIA**

**Inter-Agency:
e.g. NSA, DISA, DHS,
DIA, NGA, NRO**

**Test & Research:
e.g., DOT&E, DARPA,
JITC, ATEC, AFRL**

Coalition Partners

Germany   Finland   Japan

Norway   Sweden   UK

**Deputy
Directorate
C5 Integration**

**Combat
Capability
Development**

**C4 & Cyber
Assessments**

**Coalition
Interoperability**

Joint Fires

**Architecture
&
Integration**

**Data
&
Services**

**Joint Deployable
Analysis Team**

Joint Staff

**J7: Training Solutions /
Warfighter Challenges /
Joint Concepts**

J3: Situational Awareness

J3 / J5: Planning & Execution

J8 / 5 / 3: Global Force Mgmt

J5: Security Cooperation

CCMDs

Service Developers

Navy FFC: Norfolk

Army TRADOC: Ft Eustis

Air Force ACC: Langley AFB

MCCDC: Quantico

Joint and Coalition Mission Threads
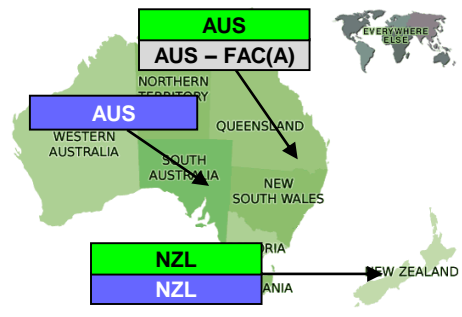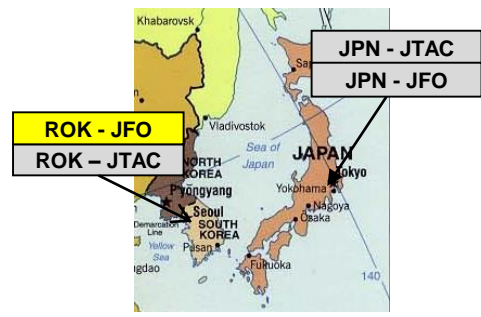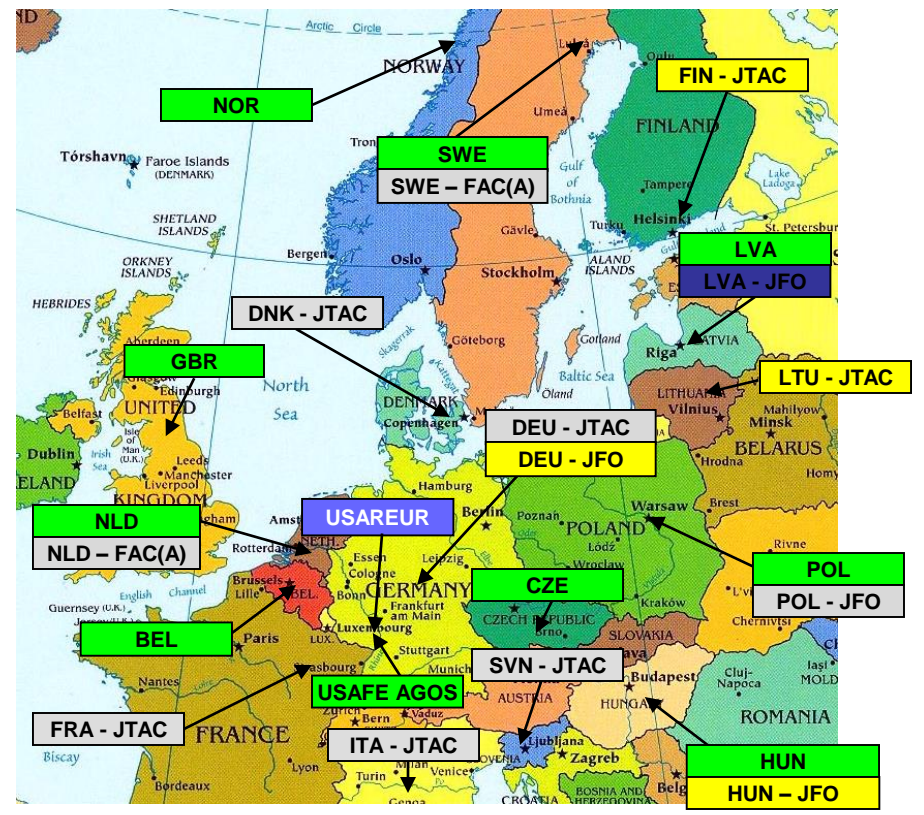
Service-Specific
Call for Fires

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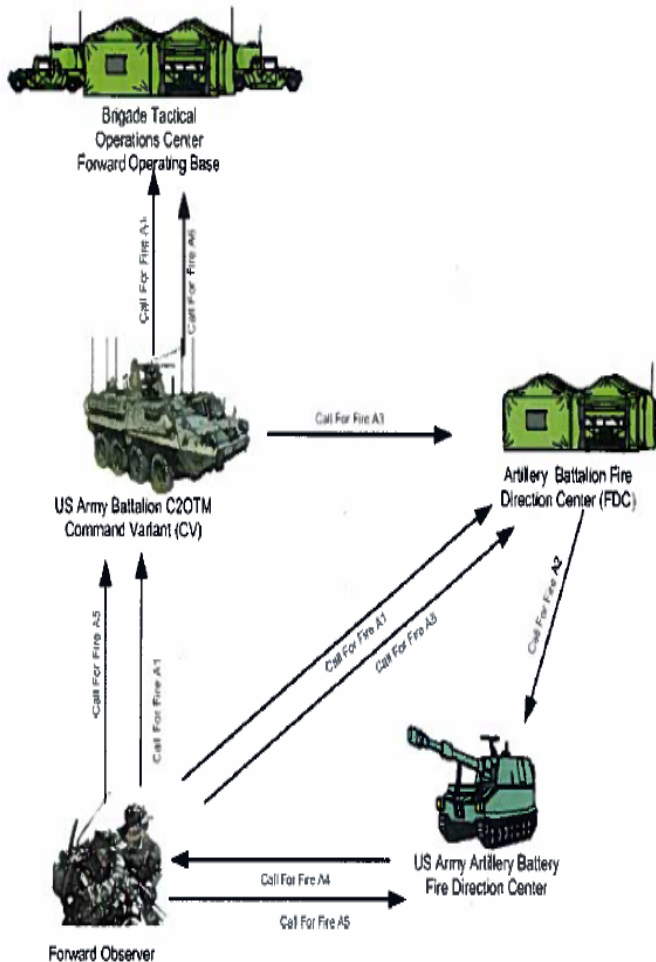
Mission Event No.	Description
1	Unit detects target
2	Commander decides to request CAS
3	Unit notified TACP < 3min
4	TACP passes request to ASOC
5	ASOC coordinates with senior ground HQs which approve request
6	ASOC assigns on-call aircraft
7	CRC send aircraft to contact point (CP)
8	AWACS passes critical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

CRC

Senior Ground HQ

Cross Service

CAS aircraft

JSF
F-15
F-16
F-18C-F
AV-8B
F-18C/D
A-10
B-1
COALITION

ASOC/ DASC

Cross Service

JTAC

TACP

Cross Service

SYSTEMS:
TACP-CASS
STRIKELINK
BAO-KIT
COALITION

Observer

Hostile targets

Commander

USA/USMC/ COALITION

Brigade Tactical Operations Center Forward Operating Base

US Army Battalion C2OTM Command Variant (CV)

Artillery Battalion Fire Direction Center (FDC)

US Army Artillery Battery Fire Direction Center

Forward Observer

Call For Fire A1
Call For Fire A6
Call For Fire A1
Call For Fire A5
Call For Fire A1
Call For Fire A1
Call For Fire A3
Call For Fire A2
Call For Fire A4
Call For Fire A5

Service-Centric to Enterprise-Centric Approach

JTAC, FAC(A) and JFO MOA
Accredited Schoolhouses / Programs / Engagement

NSAWC
NSAWC

CAN
CAN - JFO

6CTS/AGOS
6CTS/AGOS

EWTGPAC
EWTGPAC

SOCOM

EWTGLANT
EWTGLANT

FCoE Ft Sill
MCAD Ft Sill

MAWTS-1

SOTACC

NOR

FIN - JTAC

SWE
SWE – FAC(A)

LVA
LVA - JFO

DNK - JTAC

GBR

LTU - JTAC

DEU - JTAC
DEU - JFO

NLD
NLD – FAC(A)

USAREUR

POL
POL - JFO

CZE

BEL

SVN - JTAC

USAFE AGOS

FRA - JTAC

ITA - JTAC

HUN
HUN – JFO

Accredited JTAC Program

Accredited FAC(A) Program

Accredited JFO Program

MOA Signatory – Accreditation Pending

Talks in Progress

JPN - JTAC
JPN - JFO

ROK - JFO
ROK – JTAC

AUS
AUS – FAC(A)

AUS

NZL
NZL

UAE
UAE - JFO

JOR - JTAC

KSA - JTAC
KSA - JFO

BOLD QUEST 16.2 Threads

Coalition ISR

- Joint and coalition partnership to share intelligence from multiple ground and air sources
- Drive operations and target engagement across multiple initiatives and throughout a common scenario
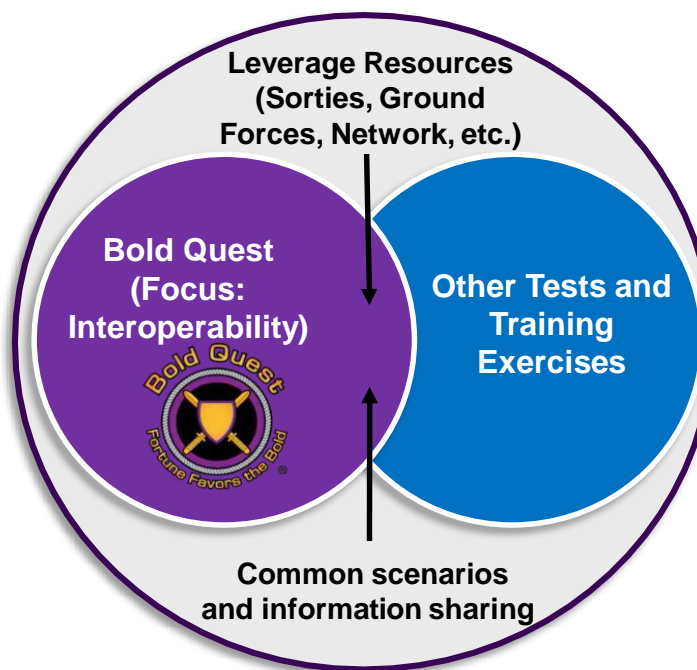
Joint Fire Support

- Joint and coalition digital interoperability end-to-end from JFO / JTAC to CJTF
- Multiple nations participating with distinct system types exercising extensive cross-service and cross-nation threads
- JFOs from multiple nations demonstrating digital interoperability in a live fire event

Integrated Air and Missile Defense

- Exercising engagement authority and procedures in a robust BLUFOR / OPFOR, live and simulated sorties
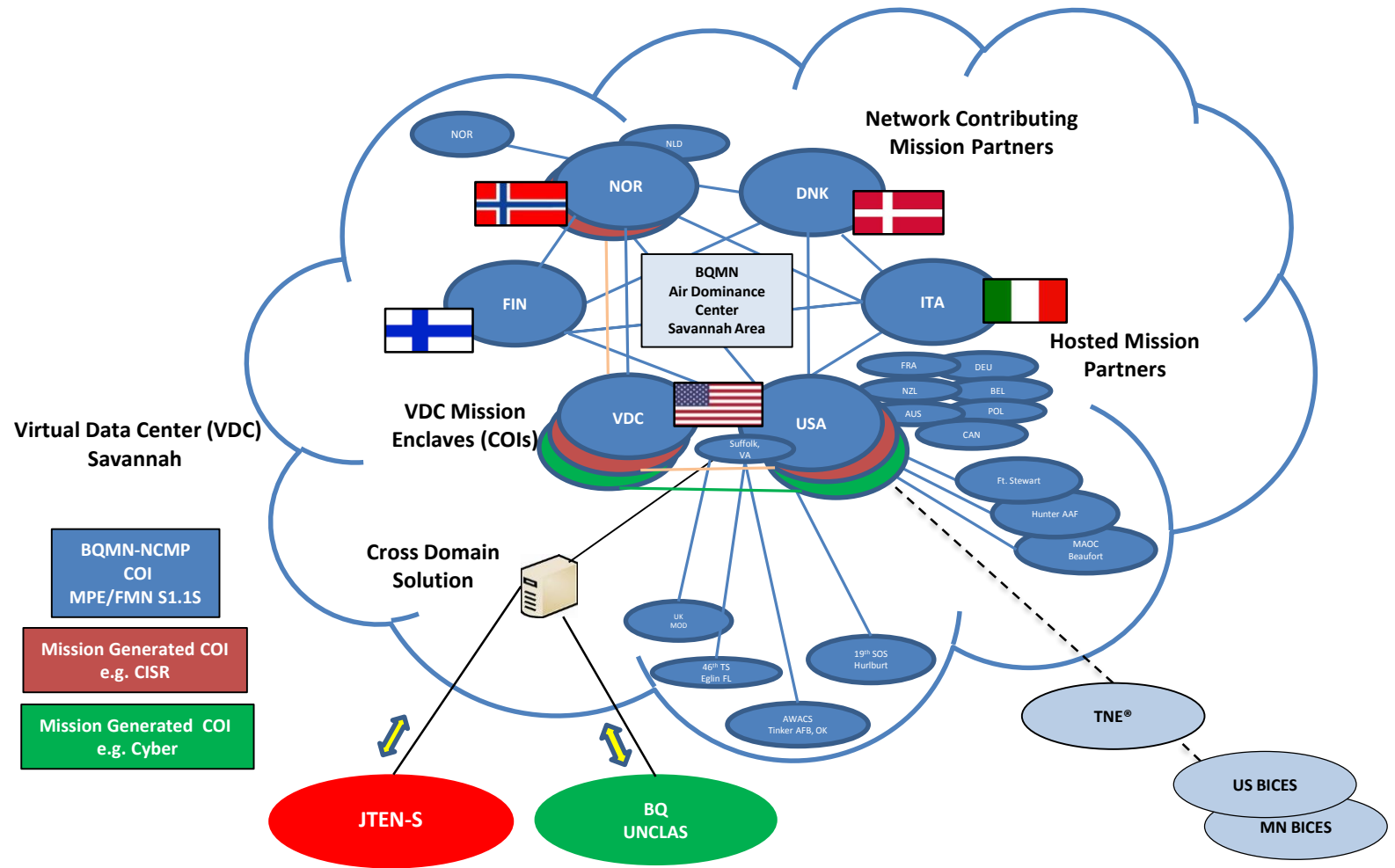- Air-air; surface-air; air-surface engagements in a complex air and surface environment

Live/Virtual Environment

- Coalition JTAC / JFO and Aircrew in distributed virtual sim (CONUS / OCONUS), with Air Support Operations Center (ASOC) and ISR support

Digitally Aided Close Air Support

- Digital interoperability among joint terminal attack controllers (JTAC), aircrew and C2 nodes
- Multiple nations with several JTACs, conventional and SOF, per nation
- Concurrent credit toward individual JTAC annual sustainment training

Friendly Force Tracking and Ground-Air Situational Awareness

- Demonstrating shared SA between US and Coalition hand-held FFT systems
- Developing NATO Interoperability standards with multiple nations and NATO HQ
- Provide ground tracks to fixed wing aircrew conducting CAS for SA and fratricide avoidance

Cyber

- Stand-up multi-national cyber cell
- Conduct cooperative vulnerability assessment
- Cyber OPFOR effects

New in BQ16.2

Coalition Network (Federated Mission Networking)

- Federated environment encompassing national networks / systems
- Each nation follows their own national policies and operates their own mission command systems and core services for collaboration
- Guided by collaboratively developed Joining, Membership and Exit Instructions (JMEI)

Leverage Resources (Sorties, Ground Forces, Network, etc.)

Bold Quest (Focus: Interoperability)

Other Tests and Training Exercises

Bold Quest — Fortune Favors the Bold

Common scenarios and information sharing

BOLD QUEST 16.2 Mission Network (11 Oct-3 Nov 2016)

Network Contributing Mission Partners

NOR

NLD

NOR

DNK

BQMN
Air Dominance
Center
Savannah Area

FIN

ITA

Hosted Mission Partners

FRA · DEU · NZL · BEL · AUS · POL · CAN

Virtual Data Center (VDC) Savannah

VDC Mission
Enclaves (COIs)

VDC

USA

Suffolk, VA

Ft. Stewart

Hunter AAF

MAOC Beaufort

BQMN-NCMP COI MPE/FMN S1.1S

Mission Generated COI e.g. CISR

Mission Generated COI e.g. Cyber

Cross Domain Solution

UK MOD

46th TS Eglin FL

19th SOS Hurlburt

AWACS Tinker AFB, OK

TNE®

US BICES

MN BICES

JTEN-S

BQ UNCLAS

Coalition Interoperability Assurance and Validation (CIAV)

- **Resolves mission-based interoperability problems BEFORE new systems and software are fielded**

- **Desk Top Analysis (DTA) methodology assesses end-to-end information exchange across DOTmLPF-P (solutions not always technical)**

- **Validates Coalition Mission Threads (CMTs) and Coalition Tactics, Techniques, and Procedures (CTTPs)**

Coalition Verification and Validation Environment (CV2E)

- **Coalition Test and Evaluation Environment (CTE2) replicates Afghanistan Mission Network (AMN) and systems**

- **Coalition Verification and Validation Environment (CV2E) simulates Mission Partner Environment (MPE) / Federated Mission Networking (FMN) systems**

DDC5I now leads U.S. CIAV

Technology Integration Example: Hand-Held Link 16 (HHL-16)

USSOCOM / C5AD project and JCTD project to integrate, assess, and rapidly field a handheld tactical datalink radio

- **Connects dismounted Joint Terminal Attack Controllers (JTACs) directly into LINK 16 network to digitally call for fire**

- **Provide all nodes with accurate situational awareness in joint integrated air and ground common operational picture**

- **Prevents fratricide and minimizes collateral damage**

- **Enables command and control in degraded RF environments**

- **Enables US and coalition forces to leverage worldwide L-16 capabilities of 50+ nations**

Hand Held Link 16 (HHL16) OV-1

Overview
- JTAC on the OBJ conducting a SOF Target Engagement
- Utilizing the HHL16 radio to join the L16 network, enables JTAC to communicate with the CAS ACFT, ISR Platform and C2 HQ; significantly reducing the kill chain.
- UHF LOS and BLOS used for mandatory verbal portions of the 9 line
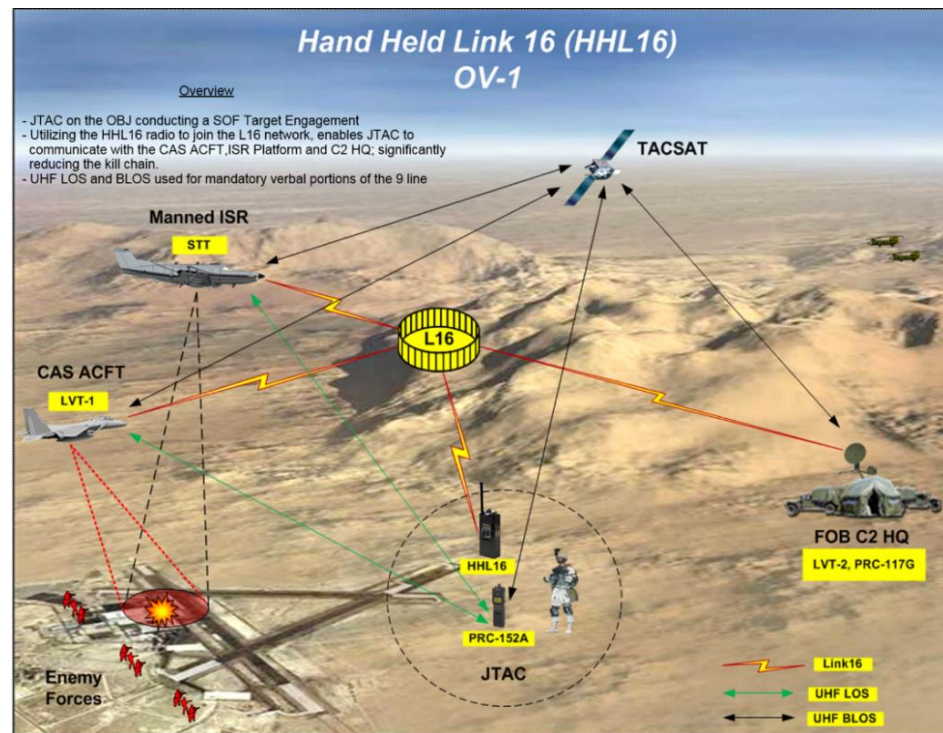
HHL-16 deployment began in FY 17

Technical Capabilities

Visual Analysis and Mission Monitoring Tool
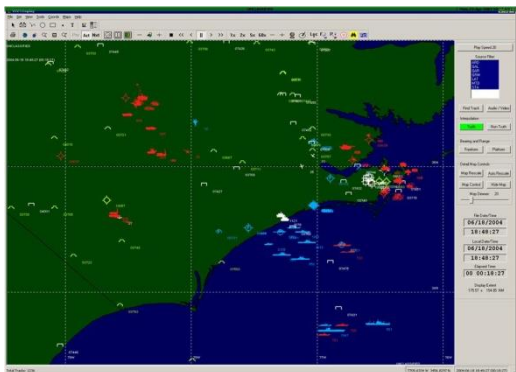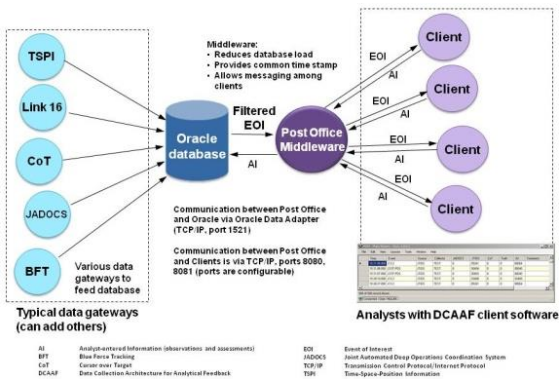

JDAT Capability Assessment Process
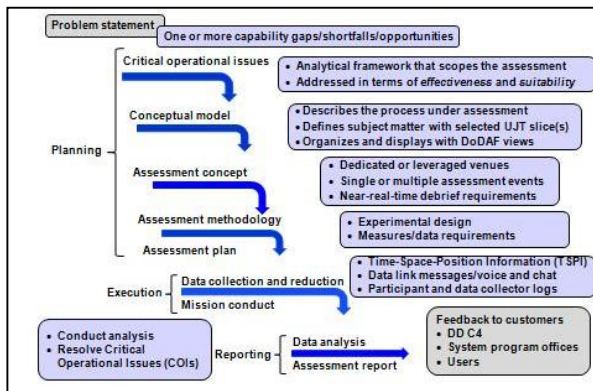
Deployable Technical Operations Center

Data Collection Architecture for Analytical Feedback (DCAAF)
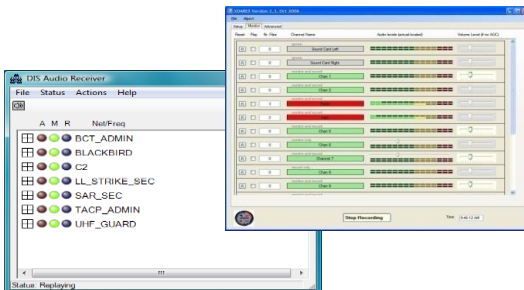

Delivering decision-quality recommendations from combatant command, multinational, and Service venues
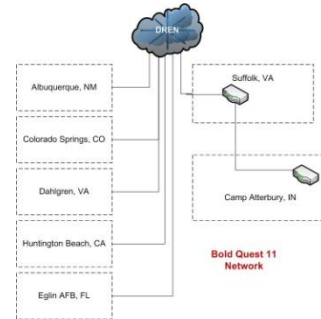
Communications Assets

Software Applications

Distributed Operations

Joint and Coalition Interoperability Enablers

Interoperability built in, not added on

Coalition interoperability as a requirement

Policy that supports coalition information exchange

Leverage community of interest initiatives

Leverage interoperability forums

Common standards, standardized implementation

"Coordinated" acquisition across Services and nations

Machine-to-machine ideal but not required

Tactics, techniques and procedures

Training is key: "Train like we will operate"

Contact Information:

Scott Shephard

U.S. Joint Staff J6

757-836-0632

scott.s.shephard.civ@mail.mil