



Joint, Alliance and Coalition C2 Integration and Interoperability

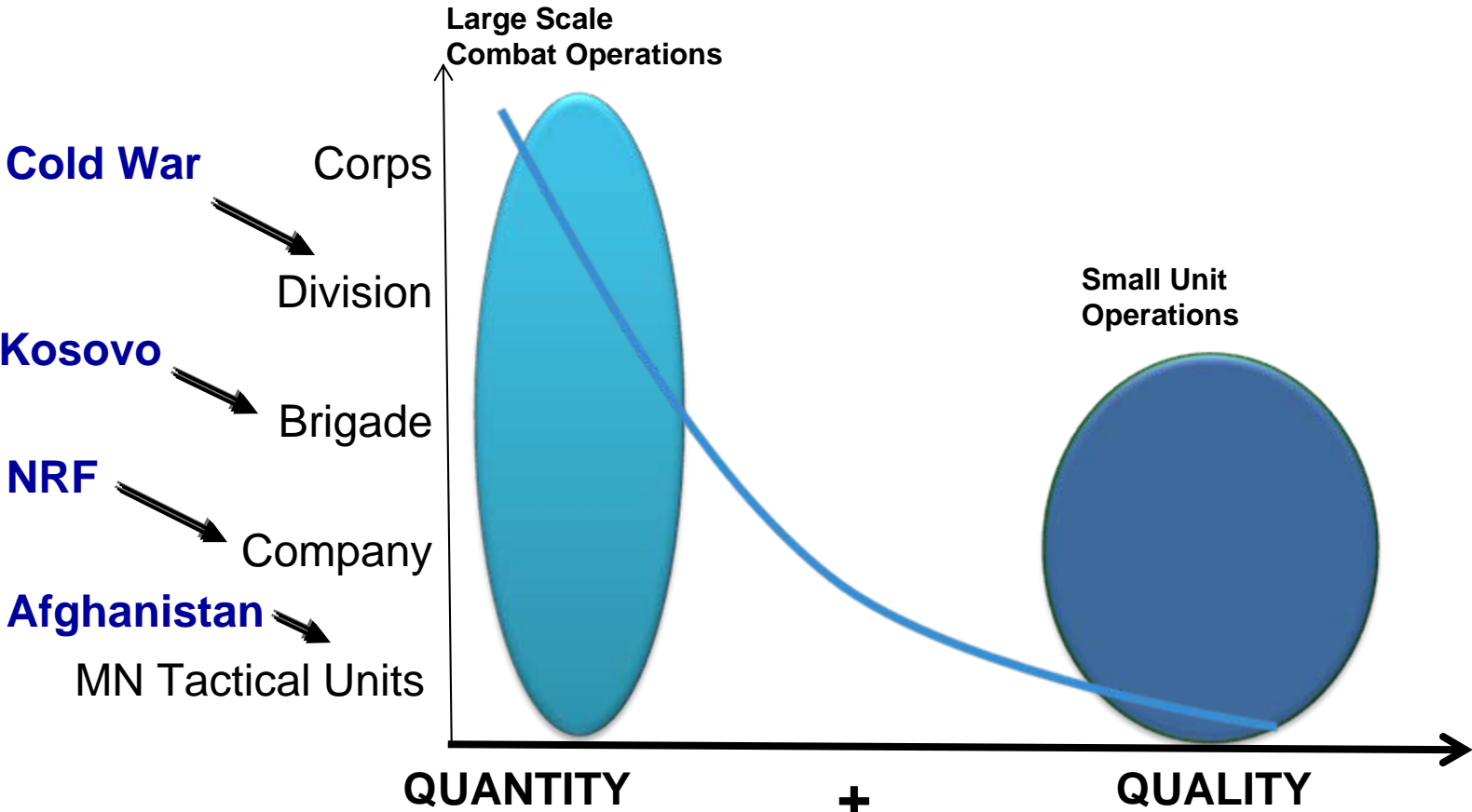
“from the tactical level through...the global level”

Major General Kevin Kennedy
Director, Joint Capability Development
U.S. Joint Forces Command

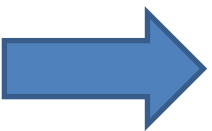
Mr. Jim Soligan
DCOS Capability Development
NATO Allied Command Transformation



Adapting to the Changing Nature of Capability Requirements



INTEROPERABILITY
"Key to Success"



HQ:
Reachback; Cyber Defense; OPS/Intel fusion; MN Logistics; Net Enabled C2

Forces:
Comprehensive Approach
Independent small unit operations – mobility; logistics; decision support; Joint Fires



Focus is the Warfighter's Tactical Edge

Very Technical / Very Complex



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Austere Conditions, Ranging From Permissive to Hostile C4 Environments



Warfighter Tactical Edge

Leader Centric – Net Enabled

- **Very Technical, Very Complex**
- **Jointness & Coalitions are Not Natural**
 - **Hard Work...Requires Trust**
- **Information Age...the “Double Edged Sword”**
 - **Makes Interoperability More Important and More Difficult**
 - **Presents Tremendous Opportunities & Vulnerabilities**
- **Must Work Enterprise Solutions, thus need:**
 - **Processes for Collaboration / Consensus Building**
 - **Work Solutions Through Multiple Lanes With Partners**
 - **Requirements - Acquisition - Programs**
- **Need Technically Competent, Operationally Focused Assessment**



Coalition Combat Identification Bold Quest 2009

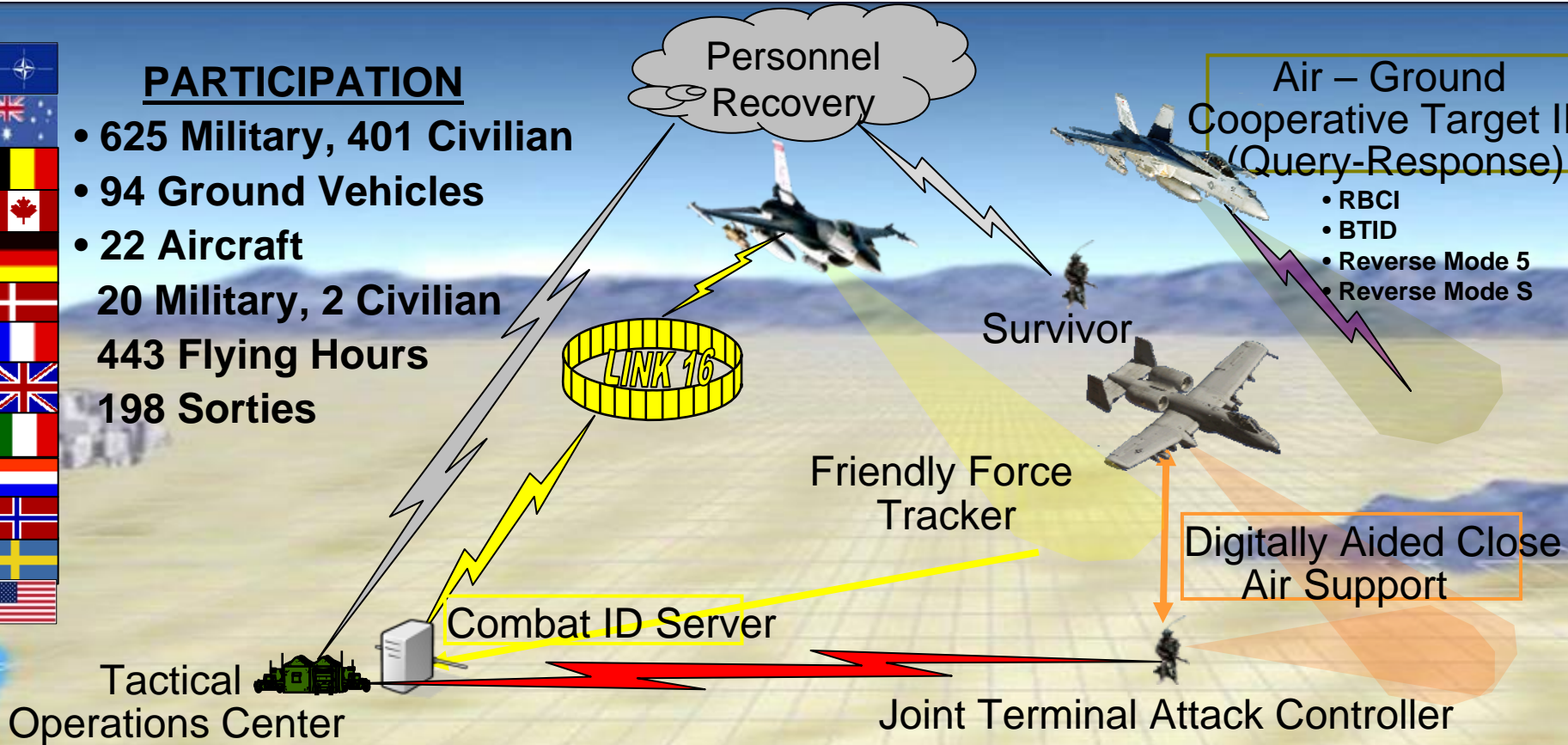


Air-to-Ground Combat Identification and Info Exchange



PARTICIPATION

- 625 Military, 401 Civilian
- 94 Ground Vehicles
- 22 Aircraft
- 20 Military, 2 Civilian
- 443 Flying Hours
- 198 Sorties



- **Combat ID Server Demonstrated Potential for Wider US & Allied User Group**
- **Significant Discovery & Fix of Standards, Hardware & Software**
- **Improved Digitally Aided CAS Tactics, Techniques, & Procedures**



ACT and JFCOM Efforts Related to AMN



Counter-IED

Counter Insurgency

Battle space Management

Joint Intelligence Surveillance and Reconnaissance

Lessons Learned

Joint Fires

Training

ACT

Networking /Deployable CIS

Info Assurance / Security Labeling

Information Exchange Gateways

Crisis Response Operations Urgent

Requirement Capability package
and Project Harmonization

Strategic Communications

Collaborative Tools

JFCOM

C2 Interoperability Testing

Training Enclave for MRX

Architecture with CENTCOM

Cross-domain connectivity

Connectivity to CENTRIX ISAF

Joint Training & Experimentation

Network (JTEN) Connectivity,
Modeling & Simulation

Interoperability

Information Sharing

Architecture

Data Standards

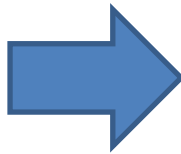
Testing



Industry's Role in Joint and Coalition C2 Integration and Interoperability

Where We Are

- Stove-piped Development
- Proprietary Systems
- Stand Alone Systems
- Sequential Timelines



Where We Are Going

- Collaborative & Spiral Development
- Open System Architecture
- Align NATO and National efforts
- Distributed Development, Testing, & Training

Field Improved and Interoperable Capability

- Leverage technology advances and commercial development rates
- Interoperable solutions expand usability across US and multi-national partners increasing market opportunities



Questions and Discussion

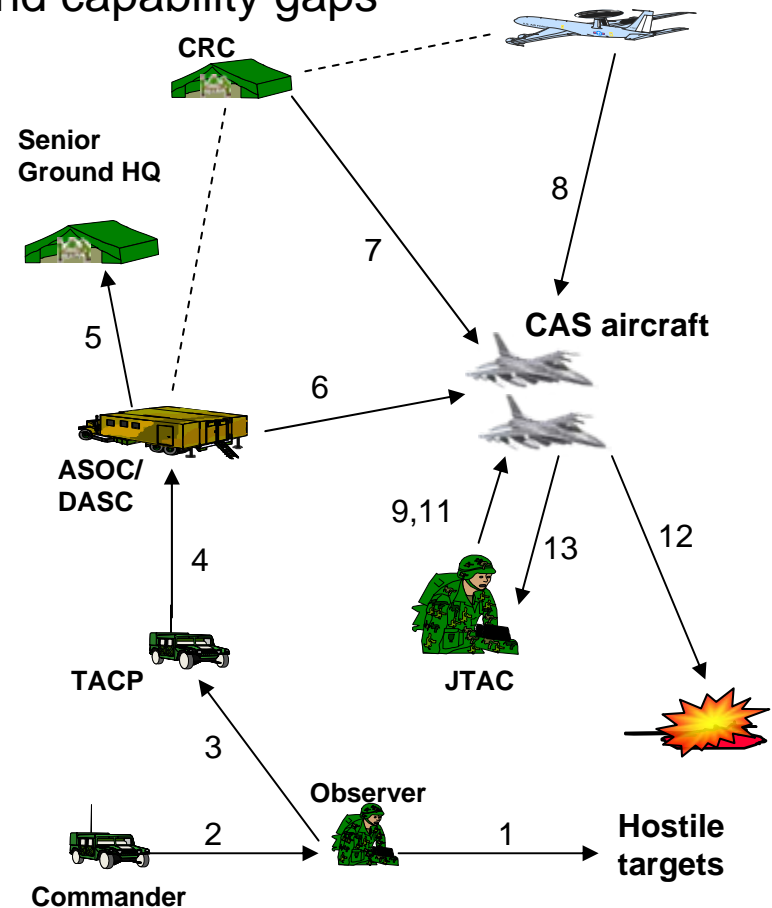


Joint Mission Thread

Digital Aided Close Air Support (DACAS)

- JMT's used during Interoperability Testing and Evaluation (T&E) and Training Exercises identified interoperability issues and capability gaps

Mission Event No.	Description
1	Unit detects target
2	Commander decides to request CAS
3	Unit notified TACP
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
9	JTAC briefs aircraft
10	Aircraft depart initial point (IP)
11	JTAC controls CAS aircraft
12	Bombs on target
13	Assessment



- Resulted in Joint Strike Fighter interoperability with the Joint DACAS participants five (5) years earlier than planned with expected savings of**

\$7.8M

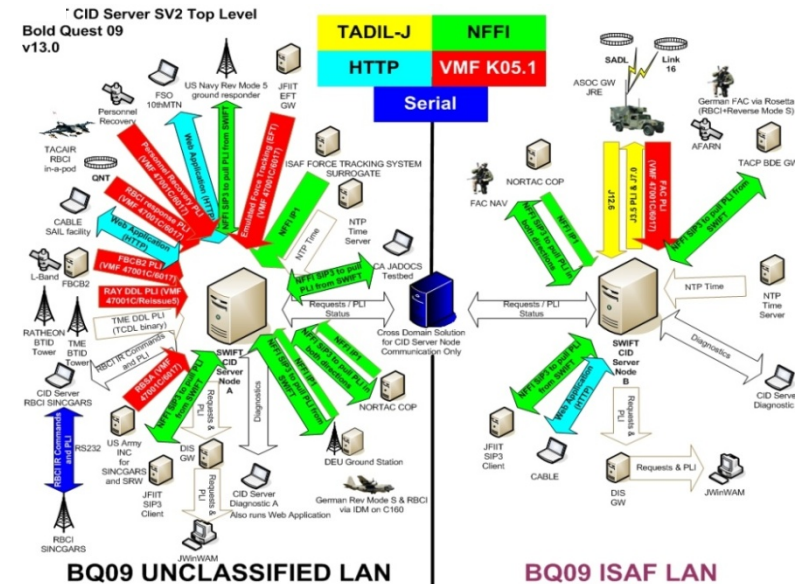
Joint Mission Thread (JMT): an operational and technical description of the end-to-end set of activities and systems that accomplish the execution of a *joint mission*.

CID Server - Overview

- Combines Friendly Force Tracking and CID data from multiple sensor networks to provide relevant target area SA to the weapons engagement decision-maker
- Provides latest friendly positions near the target to air and land-based engagement systems
 - Queries U.S and Coalition Friendly Force Tracking (FFT) Sources
 - Immediately tasks CID sensors if available
 - Displays 5 closest ground tracks in vicinity of target
- Smart pull concept minimizes bandwidth usage
 - Only relevant tracks are sent to aircraft/battle management systems
- Uses existing ground systems and infrastructure
 - No modification of existing systems required
 - US and Coalition interoperable

CID Server Activities

- CID Server was an enabling technology at Bold Quest 2009, U.S. and NATO CWID
 - Received Military Utility Assessment
 - Integrated Cross Domain Solution
 - Increased Coalition interoperability through standard NATO interfaces
- Users included JTACs/FACs, tactical aircraft, coalition battle management systems and fire support agencies
- Provided access for networked users through web browser based application
- Demonstrated high reliability and accurate data
- NATO engagement includes Concept of Employment and STANAG development



Countries engaged with CID Server

NATO	BQ09	CWID
Norway	BQ09	CWID
UK	BQ09 (UK CID Server in development)	
Germany	BQ09	
France	CWID	Sweden CWID
Poland	CWID	Italy CWID
Romania	CWID	Denmark CWID
Spain	CWID	

CENTAUR

- **Cross-domain Enterprise All-Source User Repository (CENTAUR)**
 - Evolved from Multi-sensor Aerospace-ground Joint ISR Interoperability Coalition (MAJIIC)-proven capabilities incorporating a cross-domain security service
 - Principal U.S. technology showcased in the multinational MAJIIC Project
 - Enables machine-to-machine ISR data sharing across multiple security domains
- **Empire Challenge 2009 (EC-09) Successes:**
 - Functioned as interface between U.S. Distributed Common Ground/surface System (DCGS) Enterprise and non-U.S. coalition ISR capabilities:
 - Metadata synchronization between Langley AFB (CENTAUR), The Hague (NATO Consultation, Command & Control Agency), and Ottawa (CAN) enabled coalition user discovery of and access to ISR data and products
 - Cross-Domain Solution (CDS) enabled non-U.S. coalition user discovery of data resident on U.S. Only network (DCGS)
 - Non-U.S. coalition-generated ISR products resident on national/NATO systems accessible by U.S. users
 - PRISM*-supported coalition Collection Coordination and Intelligence Requirements Management (CCIRM):
 - First demonstration of PRISM-to-CSD (Coalition Shared Data) interface; proof of concept
 - Shared collection/exploitation-related messages between PRISM and the Norwegian CCIRM tool NORCCIRM
 - Goal is to field CSD-compliant PRISM CCIRM capability enabling the automated development of a coalition collection/exploitation plan (CXP)

** Planning tool for Resource, Integration, Synchronization, and Management*

CENTAUR in EC2010

- **Critical architectural component enabling cross-domain ISR data and product sharing between U.S. and non-U.S. coalition ISR capabilities ... *Coalition Gateway to U.S. DCGS Enterprise***
- **Objectives:**
 - **Demonstrate enhanced capability to enable coalition user search, discovery, and retrieval of ISR data/product across multiple security domains**
 - Responsive to ISAF and USCENTCOM urgent need for cross-domain information sharing
 - Near real-time access to recently-gathered ISR data and archived products
 - Link NATO Full Motion Video (FMV) Distribution, Storage, Archive, and Retrieval (DSAR) capability with U.S. Valiant Angel FMV architecture
 - Enable sharing of products such as clips and stills generated from FMV data
 - Stretch goal of enabling cross-domain user discovery of and access to streaming FMV
 - **Demonstrate operationally relevant PRISM-to-CSD interface enabling automated development of coalition collection/exploitation plan (CXP)**
 - Responsive to ISAF and USCENTCOM urgent need for provision of collection management tools
 - Build on lessons learned from EC09
 - enhance tracking of coalition collection requests from nomination to satisfaction
 - build/expose complete CJTF CXP including visibility into component/subordinate tasks
 - Increase interoperability between NATO and national collection management tools
 - Enhance federated coalition ISR data processing, exploitation, and product distribution

Within an ISAF-like coalition information sharing environment, demonstrate CENTAUR capabilities that are responsive to real world war fighter needs

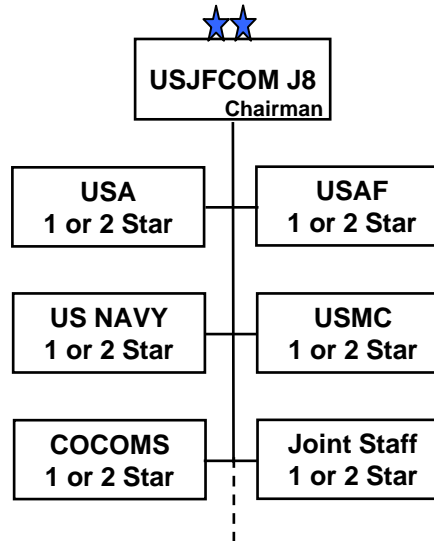
Joint Fire Support Executive Steering Committee

Joint Close Air Support Mission Area

JROC Chartered Tasks

- Represent Services, Joint Staff (JS), USJFCOM and USSOCOM to analyze CAS issues and provide recommendations
- Recommend events to demonstrate, practice and evaluate CAS initiatives
- Recommend improvements to CAS interoperability and training
- Form working groups to recommend and monitor projects, participate in evaluations and prepare reports

CAS: Close Air Support
 FAC(A): Forward Air Controller (Airborne)
 JFO: Joint Fires Observer
 JTAC: Joint Terminal Attack Controller

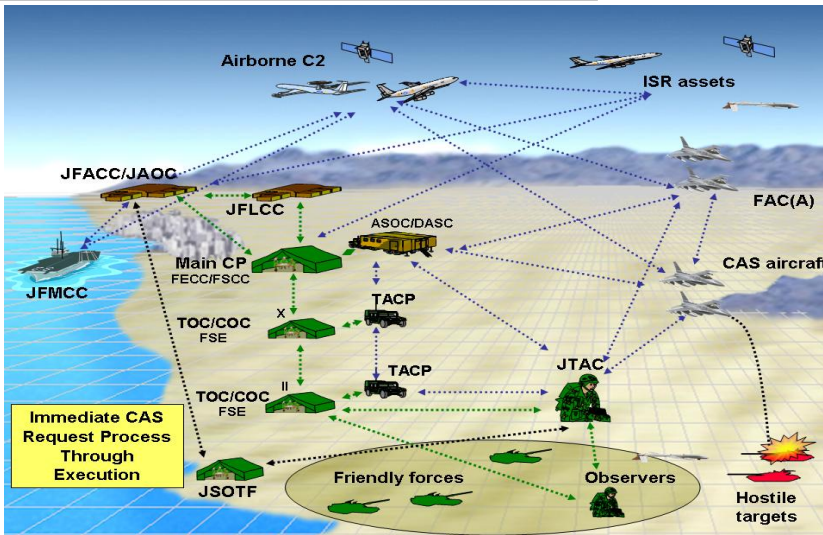


COCOMs	OSD	Partner Nations
CENTCOM	AT&L	AUS, CAN, BEL,
EUCOM		GBR, HUN, LAT
PACOM, SOCOM....		NLD, NOR &
SWE		

• Simulation

Focus on Interoperability and Fratricide Prevention

- Training & Standardization
 - JTAC/FAC(A)/JFO MOAs establish DoD standards
 - US & NATO JTAC/FAC qualification and TTP publications aligned
 - US & Partner Nation JTAC schoolhouse review/accreditations
 - 6 US & 7 Partner Nation- AUS, CAN, BEL, GBR, NLD, NOR, SWE
 - In dialogue with DEU, DNK, FIN, FRA, PAK, POL, SVK, UAE



- Accrediting Services' JTAC simulators to augment live controls
- Developing Joint Terminal Attack Controller Training and Rehearsal System (JTC TRS) to replace legacy simulators for long-term
- Interoperable JCAS Systems
 - Near-term focus on digitally aided CAS communications using Variable Message Format + gateways to non-VMF players
 - Far-term solution is net-centric compliant tactical data link and Joint Effects Targeting System (JETS)

