# Network-Enabled Battle Command for the Joint Fight

*10th Annual NDIA*
*Expeditionary Warfare Conference*

*25 October 2005*

**Colonel Jim Henderson**
**Battle Command & Awareness Division**
**US Army Futures Center**
**Training & Doctrine Command**

# Joint Operational Environment

## Full Spectrum Challenges & Implications

***Traditional***

**States employing legacy and advanced military capabilities and recognizable military forces, in long established, well known forms of military competition and conflict. *(challenge our power)***

***Extend mastery of major combat operations to drive capabilities with the broadest utility across the ROMO***

***Irregular***

**Unconventional methods adopted and employed by non-state and state actors to counter stronger state opponents. (erode our power)**

***Increase versatility and agility of the same forces on which we will rely for conventional operations***

***Catastrophic***

**Acquisition, possession, and possible employment of WMD or methods producing WMD-like effects against vulnerable, high-profile targets by terrorists and rogue states.**

***Advance expeditionary response capabilities to deter the use of or destroy Weapons of Mass Destruction***

***Disruptive***

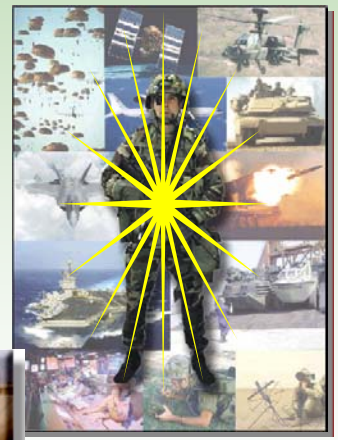
**International competitors developing and possessing breakthrough technological capabilities intended to supplant U.S. advantages in particular operational domains. *(marginalize our power)***

***Develop the intellectual capital to power a culture of innovation and adaptability***

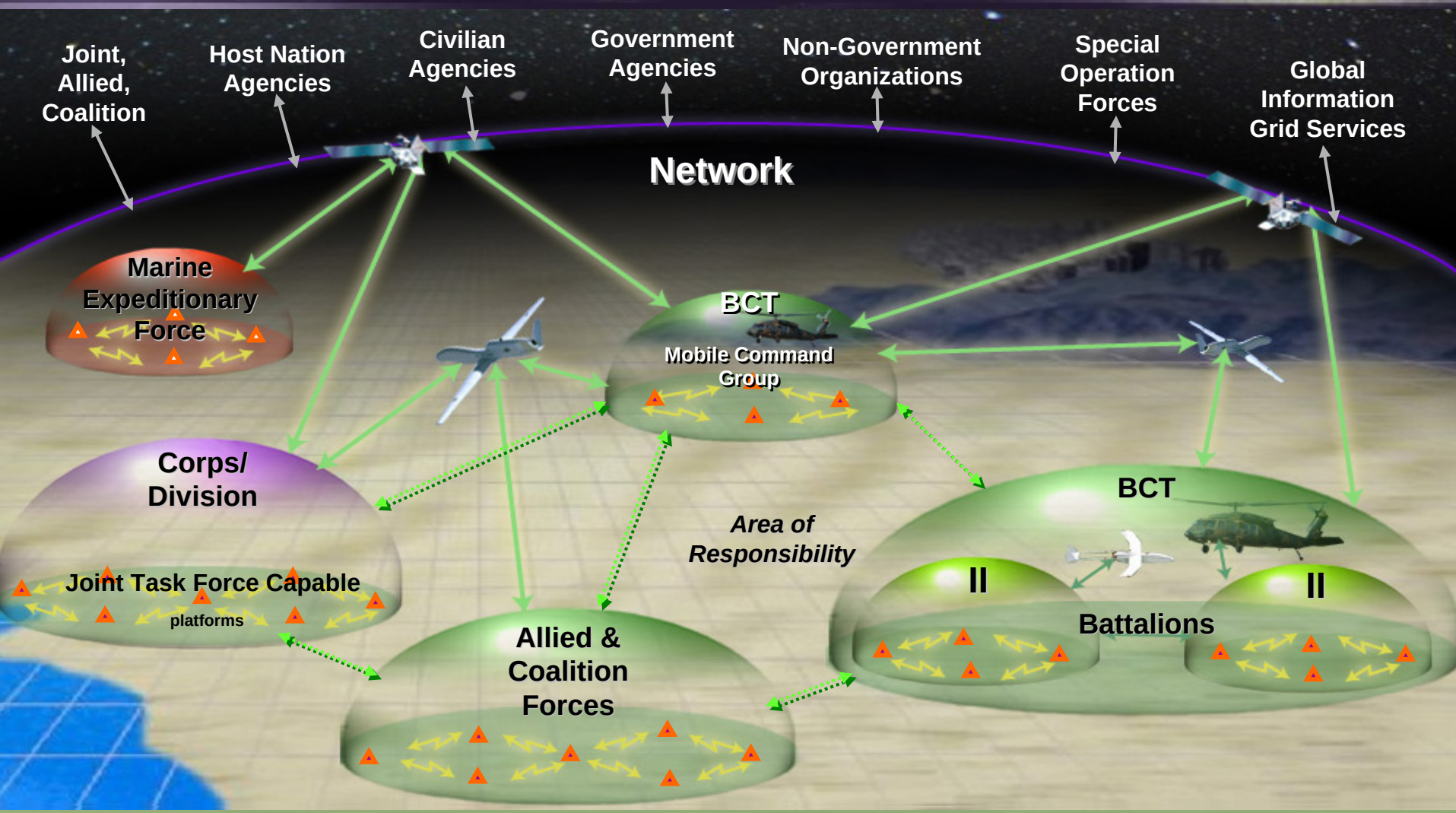
# Future Force Critical Capabilities

## Develop a Joint and Expeditionary Army with Campaign Capabilities

- **Broad range of capabilities with multiple military options for any situation, across the spectrum of conflict**
- **Rapidly deployable, highly mobile land forces able to fight on arrival**
- ***Joint networked forces (all echelons) and linked sensors, shooters, and commanders for enhanced lethality***
- **Self-sustained forces (limited periods) and a greatly reduced theater logistics footprint**



# LandWarNet




LandWarNet provides the full spectrum of connectivity – from the deployed Soldier to Home Station Operations Centers, National/Strategic Intel Centers and Logistic Support & Sustainment locations – encompassing Joint, Interagency, and Multi-National (& Coalition) capabilities.

# LandWarNet Vision

LandWarNet integrates applications, services, and network transport across the warfighting, intelligence, and business domains enabling Leader-centric operations anytime, anywhere at every echelon as a part of the Joint Force. LandWarNet is managed, defended, and operated as part of the enterprise global network. LandWarNet is spirally developed, delivered, trained, and sustained.

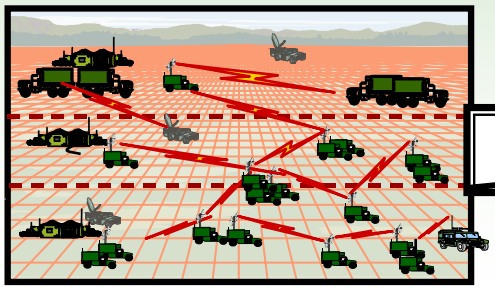
## Enabling Organizations

**LANDWARNET Board Of Directors**

- TRADOC Futures Center
- CAC/CASCOM
- TPIOs/TSMs
- TRADOC Schools

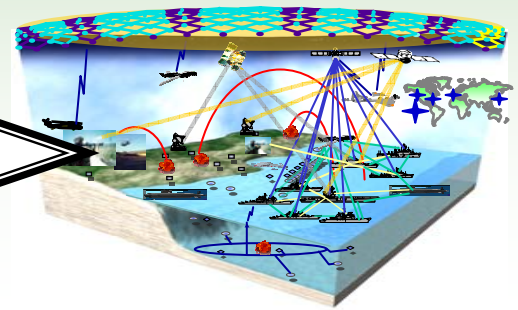
**Battle Command Steering Committee**

- Army Staff/ASA(ALT)
- PEOs/PMs
- USJFCOM, Services
- DARPA
- NATO
- Industry



LandWarNet

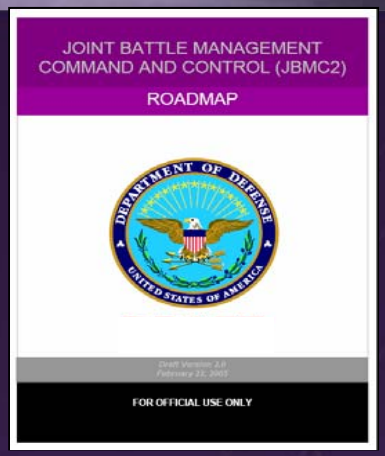
Current → Future



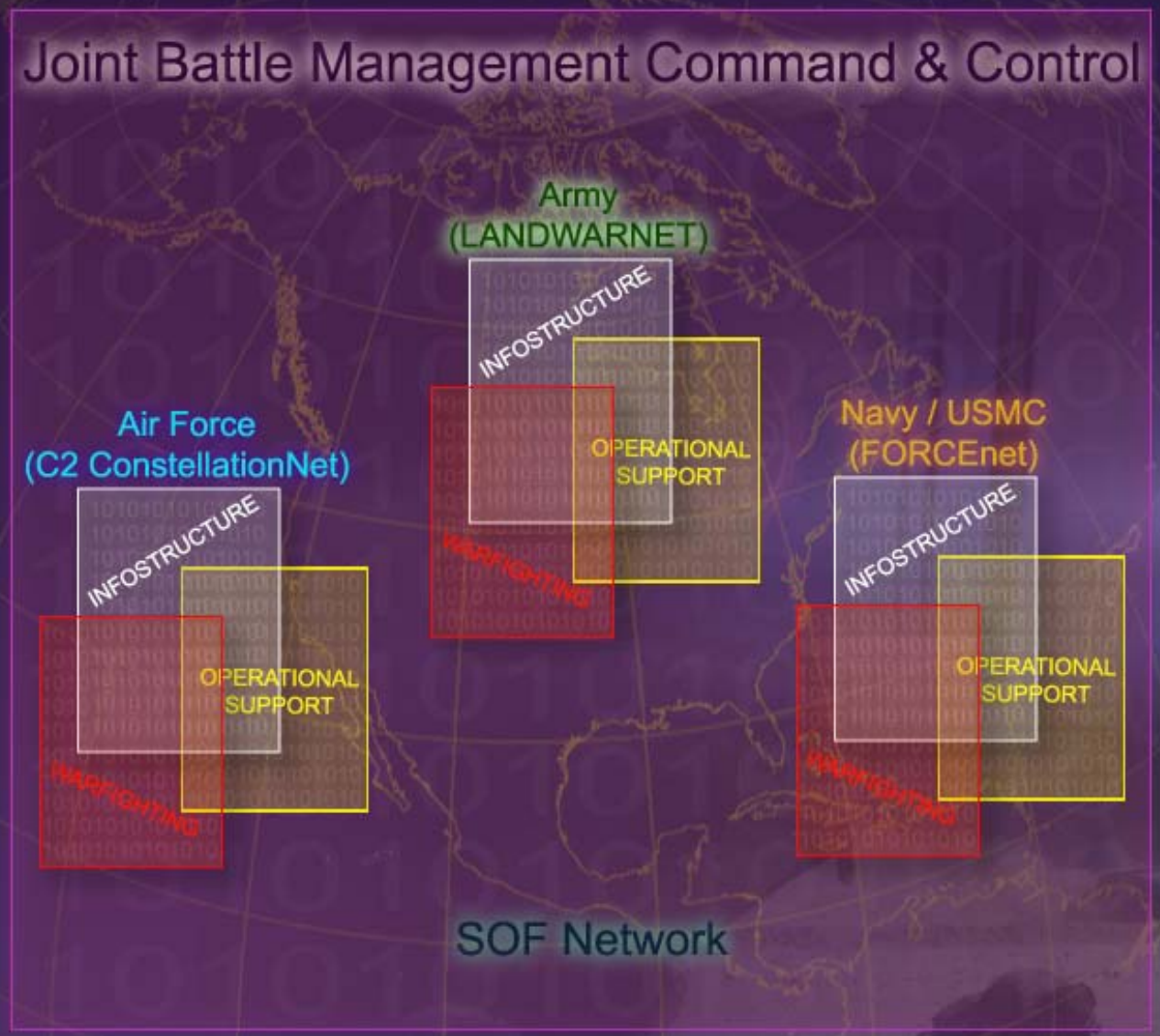
Integrates the following:

| | |
|---|---|
| Static Command Posts (CP) | Comms On-The-Move, Leader-Centric |
| Limited Connectivity & Collaboration | Global Connectivity, Collaboration |
| Tethered to fixed CP | Assured Mobile Comms Anytime, Anywhere |
| Collocated Stovepipe | One Joint Common Picture |
| Army-Centric | Joint at the Core |

# Joint Network-Enabled Force




- **Captures Joint Network Capabilities and Integration**
- **Encompasses All Aspects of Evolving**
  - **Battle Command**
  - **Communications**
  - **Information Management**
  - **Decision Support**



# Network Characteristics

- <u>The Network</u> - a key component of the Future Combat Systems
- Future battle organizations - *smaller*, yet *more lethal*
- Trade “mass” for “knowledge”
- “Knowledge” - the dominant weapon of the future
- Must move information around the battlefield
- Soldiers will derive power and safety in networked environment

***See First… Understand First… Act First… Finish Decisively***

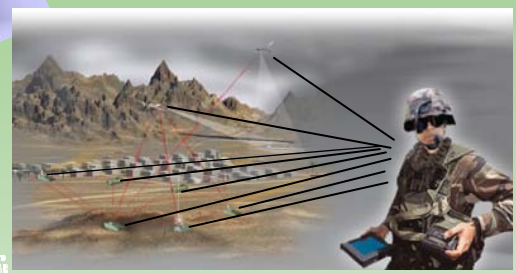
# Network Enabled Battle Command

- Better synchronizes Joint effects in the battlespace
- Connects sensors and shooters
- Increases lethality, survivability, and responsiveness

- *Single battle command system of systems that is joint-interdependent*
- *Joint-capable Army headquarters*
- *Multi-echelon collaborative information environment*
- *Horizontal and vertical sensor fusion enables all operations*
- *Battle Command on the move without degradation*
- *Mission command of self synchronizing forces*

***More Combat Power***

# Challenges in Developing the Network



- **Find the right information tools**
- **Providing Soldier the best possible set of capabilities**
- **Increasing usability and trainability**
- **Cognitive demands of networked-enabled environments**
- **Development of effective approaches to train networking skills.**

# Developing the Network - A Strategy

## Major Objective Description

**Develop operating force Integrated Network Architecture and resource plan for LandWarNet, the Army's contribution to the Global Information Grid (GIG).**

### Capability Gaps

- A unitary, mobile Battle Command System
- A multi-layered, dependable, self-healing network that enables on-the-move battle command
- Fully interoperable Joint, interagency, and multinational Battle Command System
- Standardized data format and database structures Single data fusion capability that allows data and information sharing across battlefield functions and echelons
- An application-based, multi-level security structure

### Solution Strategy

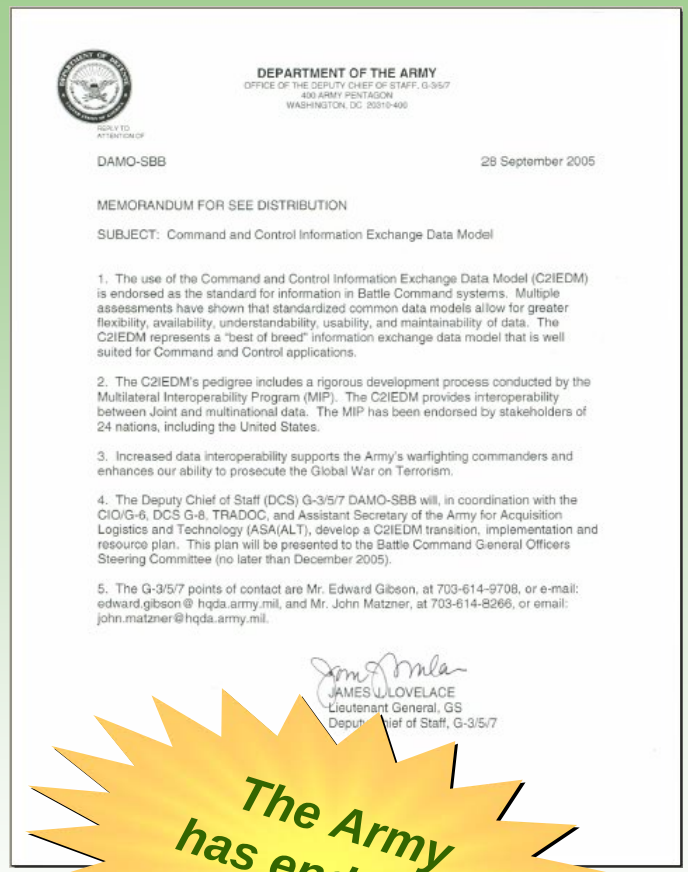
- Synchronize Battle Command capability solutions with Joint and Army acquisition strategies and the ACP
- Migrate select current BC capabilities to JC2 and FCS battle command
- Develop/execute a common net transport strategy
- Adopt a common data model and strategy
- Evaluate proposed Battle Command enhancements throughout full DOTMLPF spectrum
- Strict litmus test of operational cost-benefit analysis for any COTS/GOTS and S&T capability

### Key Strategy Means

- Information Technology Portfolio Management governance
- Battle Command Concept Capability Plan
- Battle Command Integration and Migration Plan
- Develop and field key networking capabilities: JTRS, JNN to WIN-T transition, WIN-T
- C2IEDM Transition, Implementation and Resourcing Plan
- Multilateral Interoperability Program

# Data Standards for Battle Command System Integration

- When 2 or more Battle Command systems exchange information, it is similar to people from different language groups communicating.
  - They can learn each others languages and communicate directly (This becomes increasingly difficult as other languages are added to the conversation).
  - They can learn a common language (This requires multiple translation).
- Regardless of the approach, ***something will be lost in translation***, because no two languages are identically defined.
- The best solution is for everyone to use the same language as their **"native"** language. This ensures that we say what we mean, and that what we say, is understood.
- The most practical solution is to implement a common language.



DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF, G-3/5/7
400 ARMY PENTAGON
WASHINGTON, DC 20310-400

REPLY TO ATTENTION OF

DAMO-SBB 28 September 2005

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Command and Control Information Exchange Data Model

1. The use of the Command and Control Information Exchange Data Model (C2IEDM) is endorsed as the standard for information in Battle Command systems. Multiple assessments have shown that standardized common data models allow for greater flexibility, availability, understandability, usability, and maintainability of data. The C2IEDM represents a "best of breed" information exchange data model that is well suited for Command and Control applications.

2. The C2IEDM's pedigree includes a rigorous development process conducted by the Multilateral Interoperability Program (MIP). The C2IEDM provides interoperability between Joint and multinational data. The MIP has been endorsed by stakeholders of 24 nations, including the United States.

3. Increased data interoperability supports the Army's warfighting commanders and enhances our ability to prosecute the Global War on Terrorism.

4. The Deputy Chief of Staff (DCS) G-3/5/7 DAMO-SBB will, in coordination with the CIO/G-6, DCS G-8, TRADOC, and Assistant Secretary of the Army for Acquisition Logistics and Technology (ASA(ALT)), develop a C2IEDM transition, implementation and resource plan. This plan will be presented to the Battle Command General Officers Steering Committee (no later than December 2005).

5. The G-3/5/7 points of contact are Mr. Edward Gibson, at 703-614-9708, or e-mail: edward.gibson@hqda.army.mil, and Mr. John Matzner, at 703-614-8266, or email: john.matzner@hqda.army.mil.

JAMES L. LOVELACE
Lieutenant General, GS
Deputy Chief of Staff, G-3/5/7

**The Army has endorsed C2IEDM**

# Multinational Interoperability Program (MIP)

- **Voluntary Participating Nations/Commands:**

- **Secure MIP Common Interface (MCI)**
- **No impact on other Nations' C2IS Networks:**

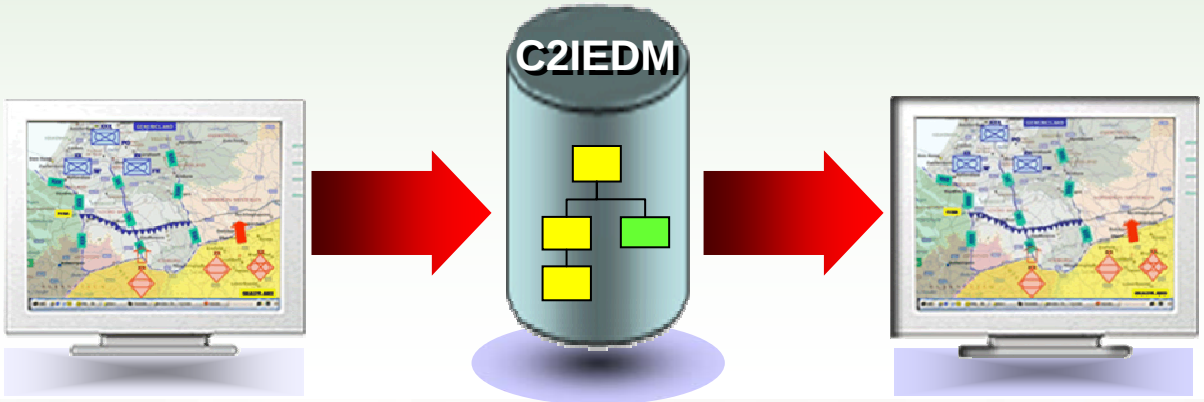
*Radio*

*Wire*

*Microwave*


*Satellite*

- **C2 Information Exchange Data Model (C2IEDM)**



# Summary

- A Networked Army provides relevant and ready Landpower to the Joint Commander
- The Network underpins the effectiveness of every system
- Enhance Soldier's lethality, protection and situational awareness
- *See* first…*Understand* first… *Act* first … *Finish* decisively
- The Soldier is the Centerpiece

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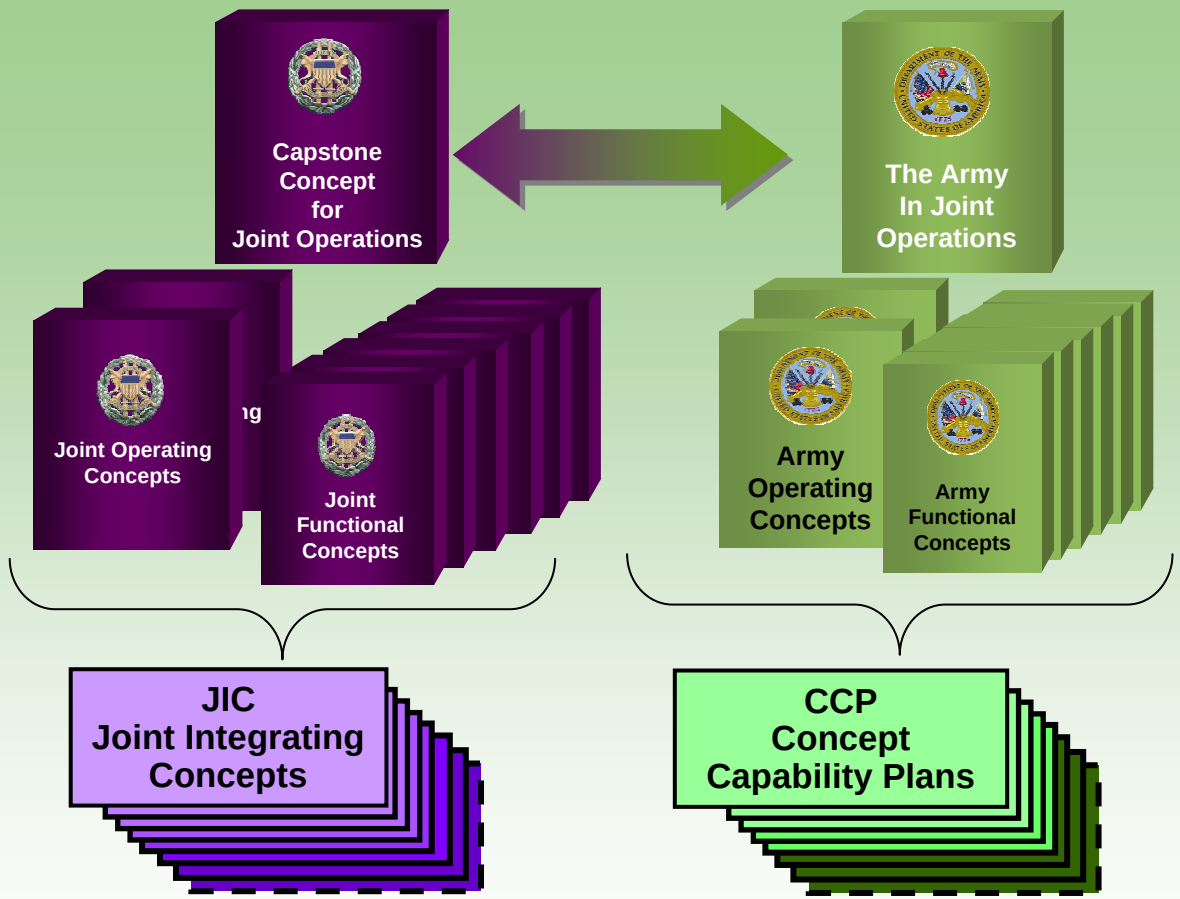
# Back Up

# Future Force Concept Strategy




Army Capstone presents a visualization of the Army's Future Force role in full spectrum, joint operations.

## Key Ideas

- Shaping and Entry Operations
- Operational Maneuver from Strategic Distances
- Intra-theater Operational Maneuver
- Decisive Maneuver
- Concurrent and Subsequent Stability Operations
- Network-Enabled Battle Command
- Distributed Support and Sustainment

# Concept Development & Experimentation

FY04 FY06 FY08 FY10 FY12 FY14 FY16

Stryker

Joint Prototype Path

Army Prototype Path

- Inform the future
- Spiral forward Future Force capabilities
- Satisfy critical operational needs
- Test compelling technology

Operational Lessons Learned

Joint Concept Development

Army Concept Development Path

Joint Concept Development Path

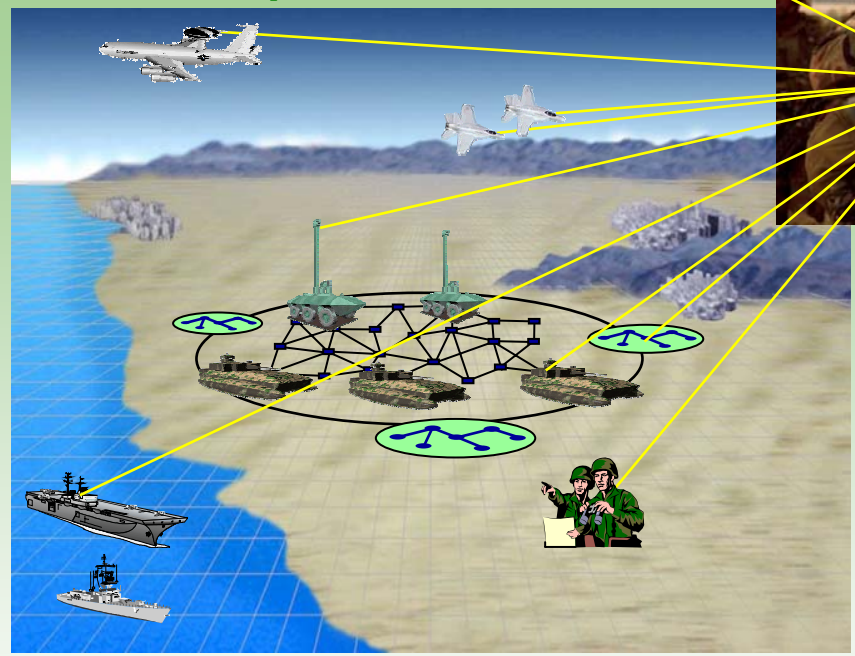
FCS

- Concepts based
- Coherently joint
- Reduce Risk
- Actionable recommendations

Menu

# LandWarNet Components

## LandWarNet Enables Leader-Centric, Joint, Interagency, & Multi-National Operations



### Network Transport

- *Space*
- *Airborne*
- *Terrestrial*
- *Infrastructure*
- *Network Terminal*

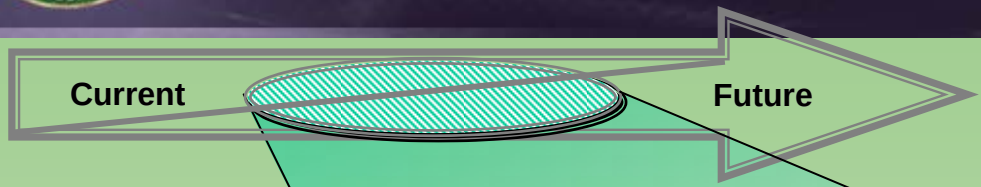
### Applications

- *Battle Command*
- *Intelligence*
- *Logistics*
- *Business*

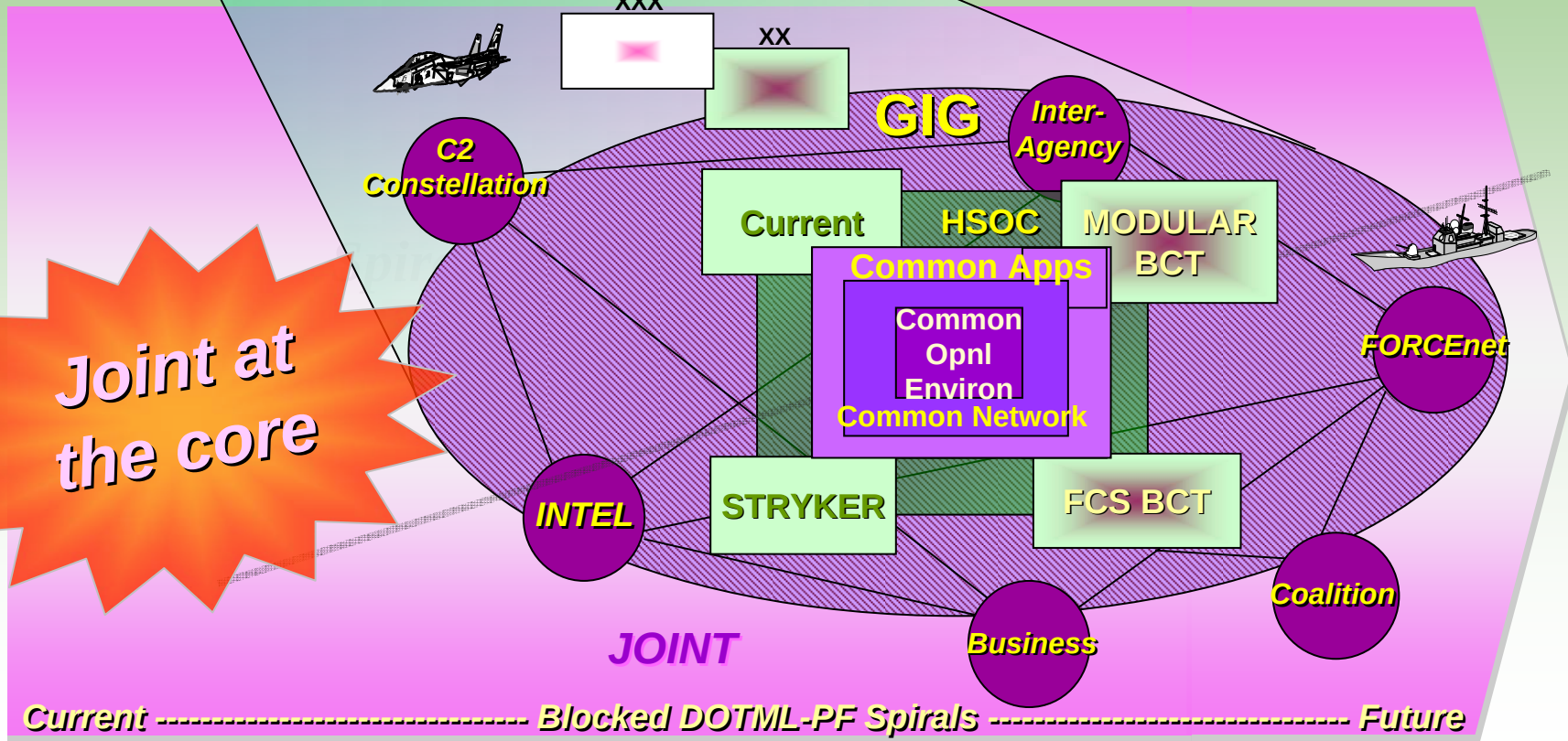
### Services

- *Voice, Data, Collaboration*
- *Mediation, Storage, Discovery, Messaging*
- *Speed of Service*
- *Quality of Service*
- *Hosting*
- *IA/Security*
- *NetOps (Info Assurance, Info Dissemination Mgt, Network Mgt)*

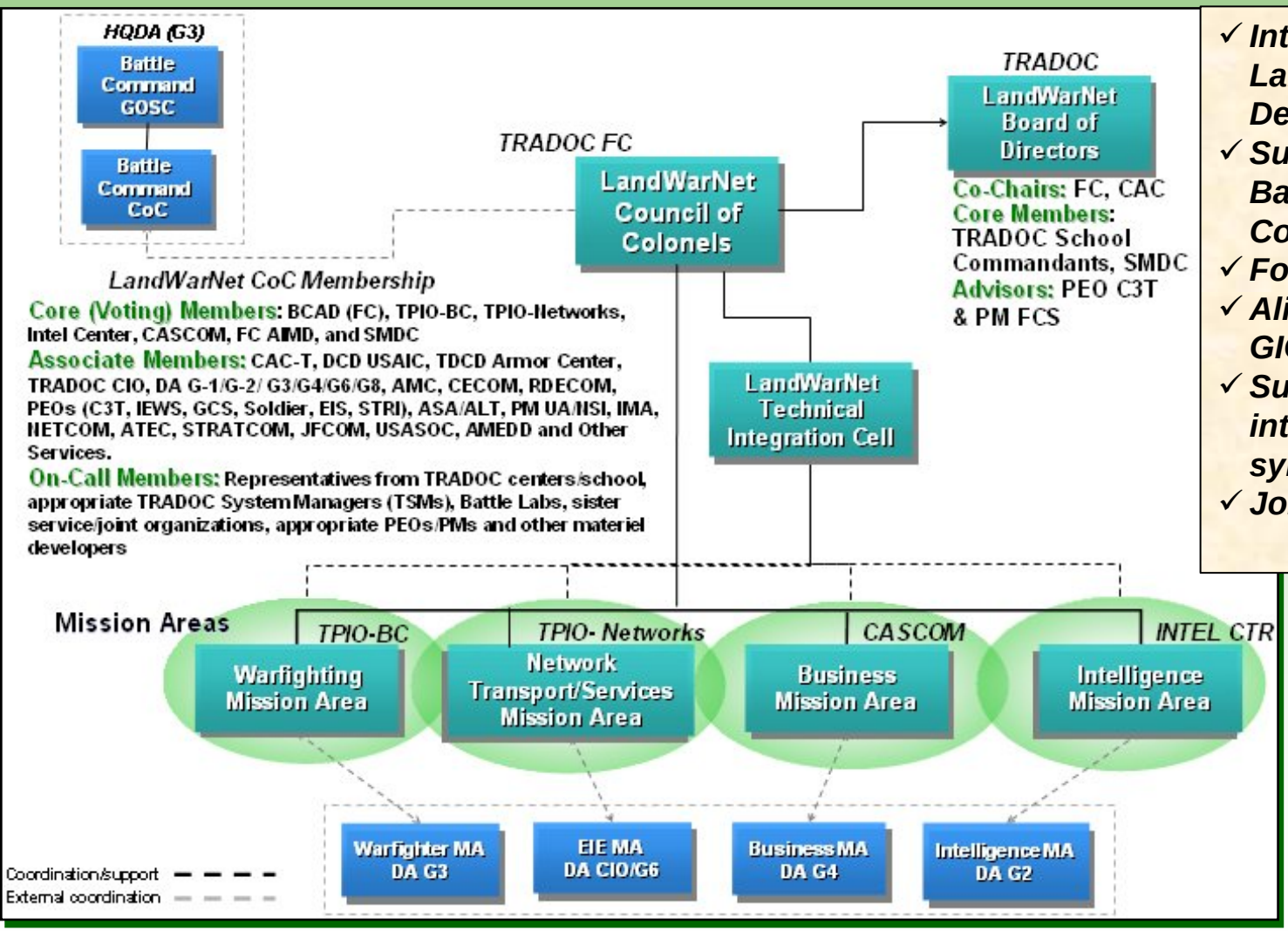
# LandWarNet Strategy




- *Spiral Towards Future by blocks*
- *Develop supporting DOTML-PF solutions*
- *Synchronize Development and Delivery with Army and Joint Transformation and Operational Mandates*

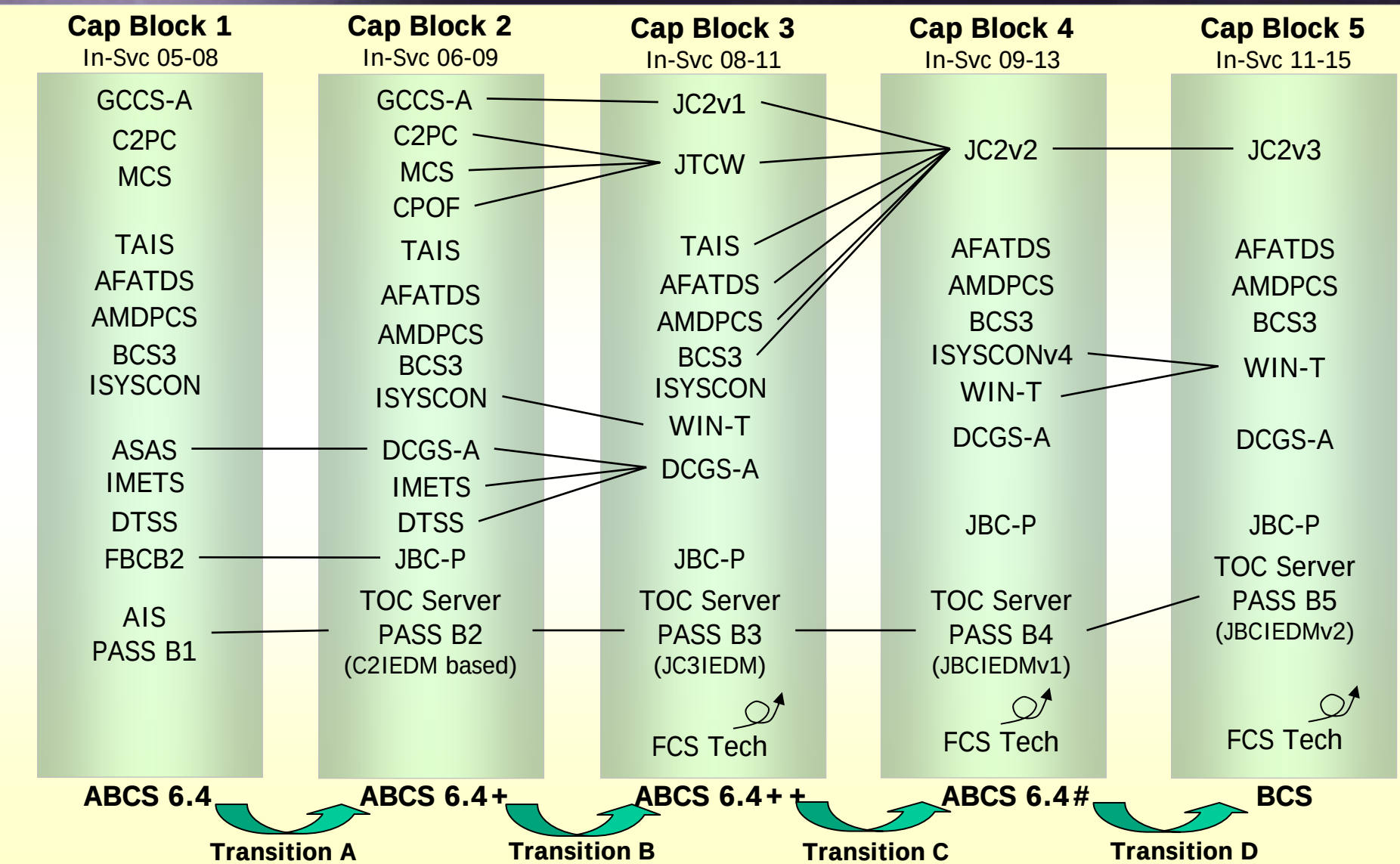


# TRADOC LandWarNet Governance Organization



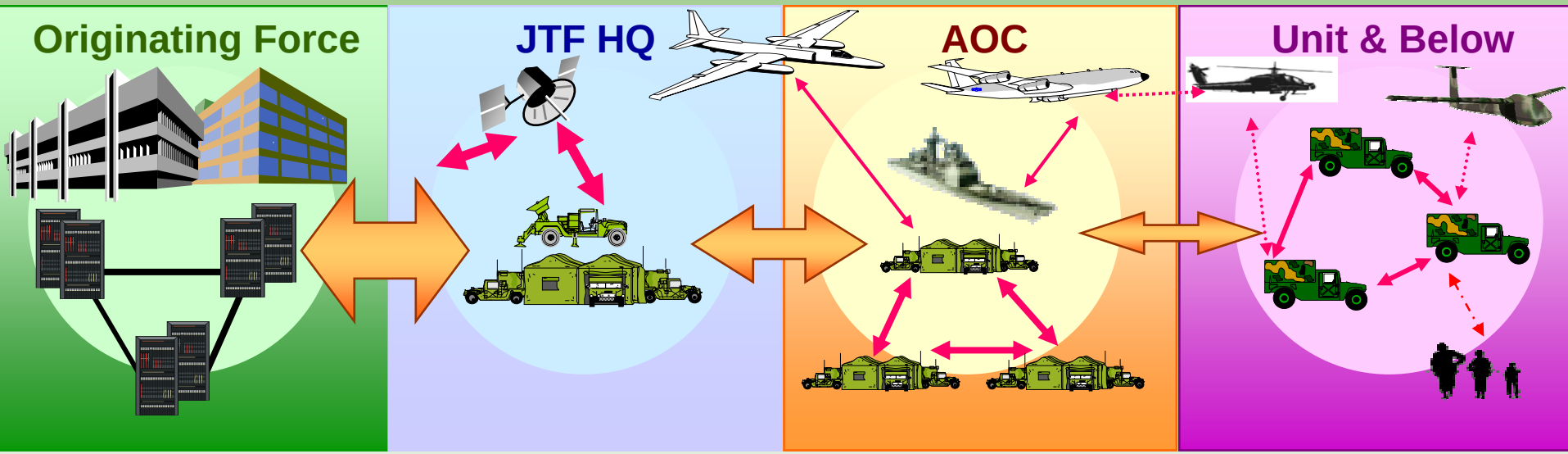

- ✓ *Integrates TRADOC's LandWarNet Capabilities Development efforts*
- ✓ *Supports HQDA-led Battle Command CoC/GOSC*
- ✓ *Focused on Warfighting*
- ✓ *Aligns with DoD/Army GIG Management*
- ✓ *Supports dynamic integration/ synchronization*
- ✓ *Joint Linkages*

# ABCS → JC² Capability Migration



# Changing "Network" Operating Environments

**Despite seamless end-to-end network, the environment changes**




**Environment factors**

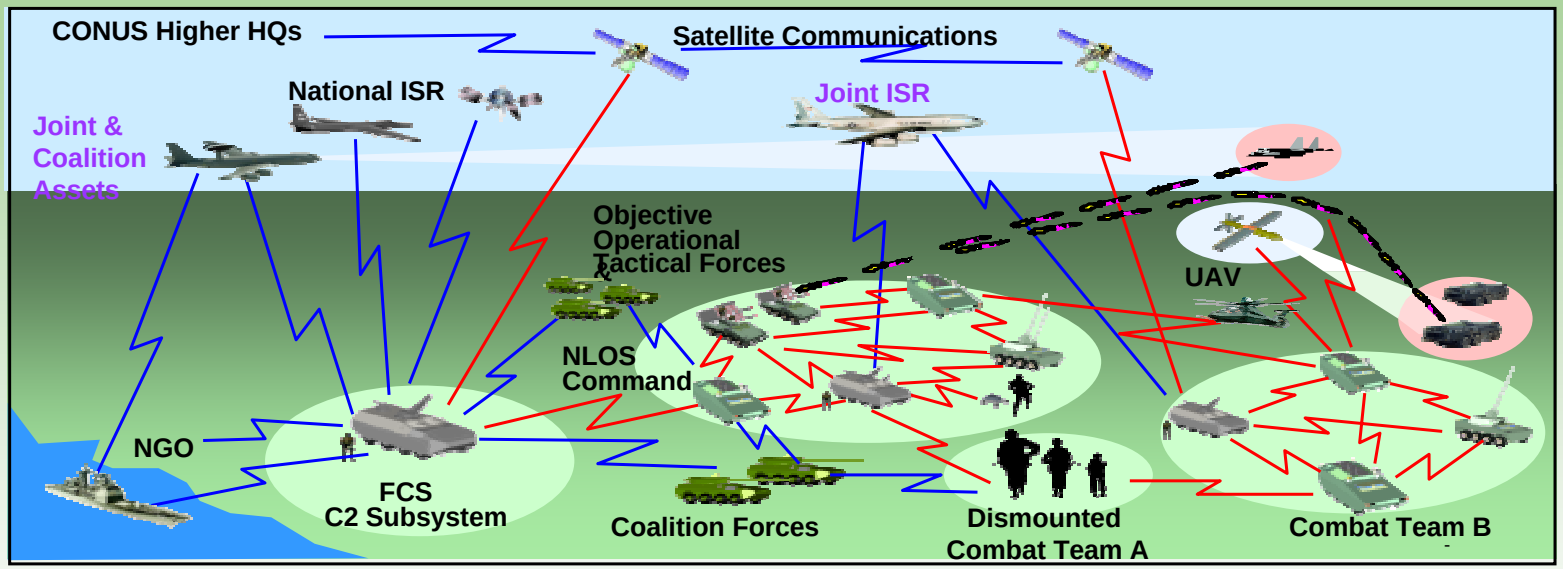
- Network capacity
- Network connectivity
- Network availability
- Equipment footprint
- Staff size and training
- Static or dynamic configuration

**How to develop Enterprise Services to support disadvantaged network users?**

**Implementation guidance should account for disadvantaged network environments**

# Unique Unit Identifiers for Provisioning Joint Networks

**Battlefield entities must be assigned unique identifiers so that we all will understand the who, what and organizational relationship of all things.**



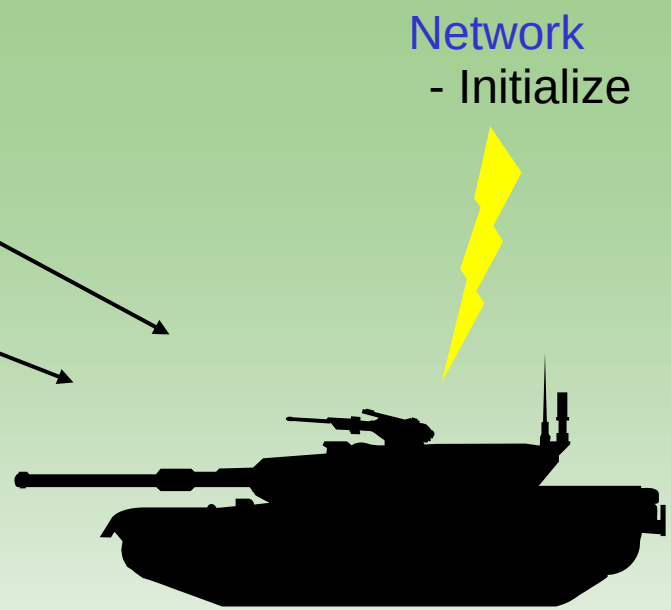

**DoD needs standard representation of critical identity information**

- Occasionally connected
- Coalition operations
- Systems interoperability
- Proximity relationships
- Limited bandwidth
- Aggregation

# Example 1

- **A Common Data Model: What**
  - **M1A2 Main Battle Tank**
- **A Unique Identifier: Which**
  - **64 bit identifier for the platoon**
- **Organizational Relationship defined by force structure**
  - **1st Tank, 2nd PLT, C Co., 4th BN, 69th Armor**

***Now we can link people, crews, supplies, missions, to their task organized forces and dynamically track them over time.***




**The structure of the task-organized force enables network initialization and addressing – e.g., "Burning Bricks"**

*It is like taking your phone number where ever you go.*

# Data Strategy Way Ahead

- Create new process based venues to achieve consensus and implement system of system capability.
- Define, implement, and enforce data standards that support the warfighter at the tactical level:
  - Develop a joint information exchange data model: (e.g. C2IEDM)
  - Implement Global Force Management (e.g. Prototype modularity)
  - Assign unique identifiers
  - Link unique IDs to IP addresses.
- Establish a governance structure which includes all Service equities and requires exceptionally strong system engineering methods within a rigorous process; and resource accordingly.