Integrating Innovative Battle Command Capabilities

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Agenda

- Understanding the Battle Command (BC) SoS Environment
- Translating S&T Understanding into BC SoS Solutions
- Integrating and Validating New BC Capabilities
- Emerging Innovative Battle Command Technology Examples

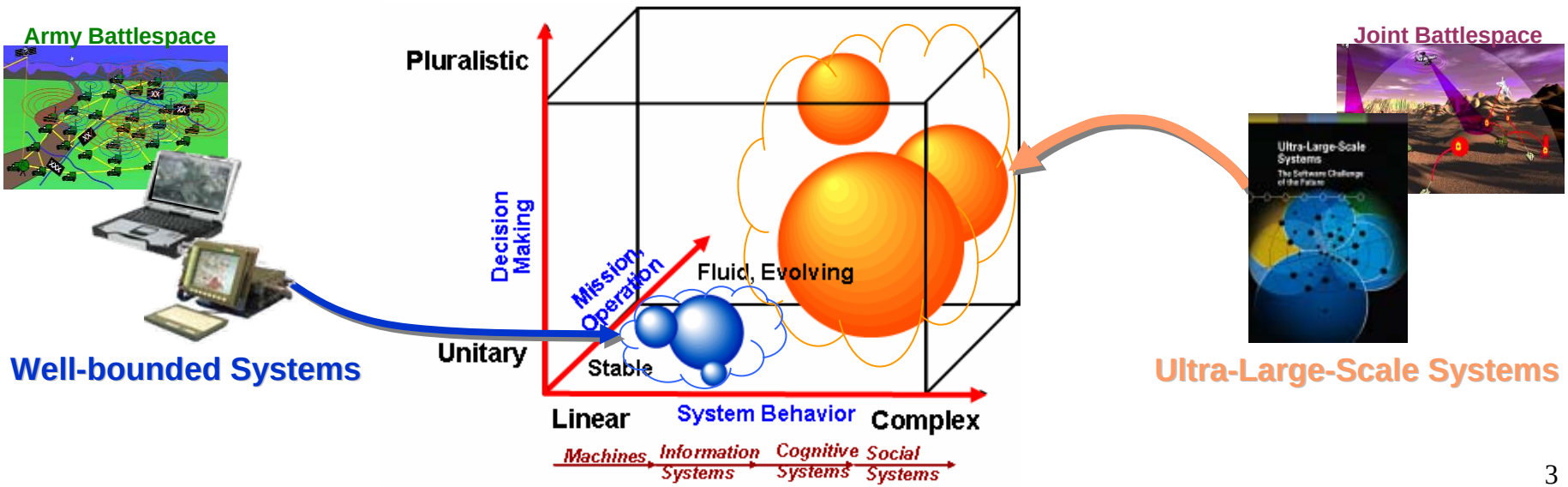
Understanding the Battle Command SoS Environment

Driving Factors

- Uncertain strategic environment demands *agile/adaptive responses*
- *Information as* competitive source of *power*
- Demand for enterprise and extended *enterprise-wide solutions*

Solution Characteristics

- Richly *interconnected*; increasingly *interdependent*
- *Cross traditional boundaries…* functional, organizational, programmatic
- *Increasing scale/scope*
- *Increasing complexity*



Army Service-Based Approach for Tactical BC Capabilities

Operational Capabilities

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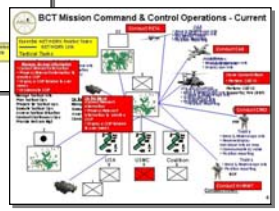
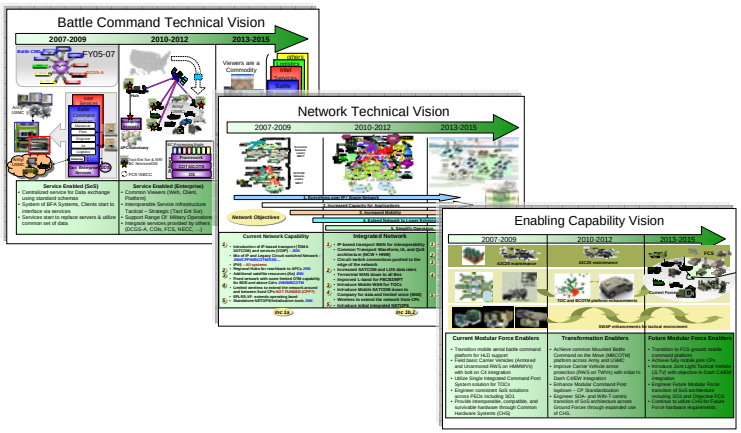


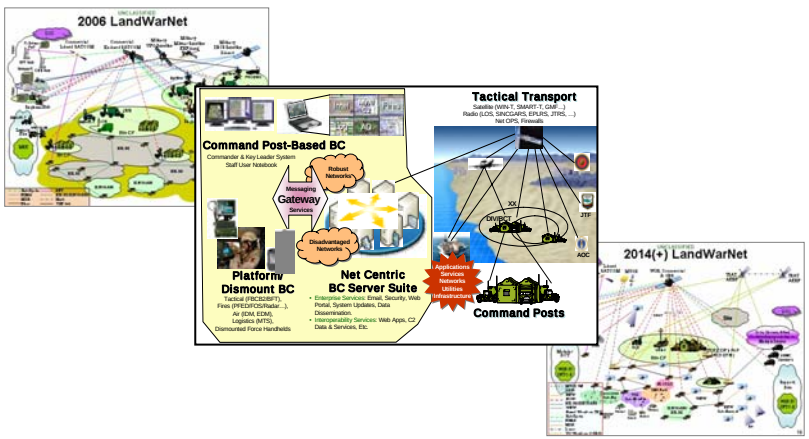
- Establish warfighter operational needs
  - *Currently reworking with "Good Enough Take 2"*

Services



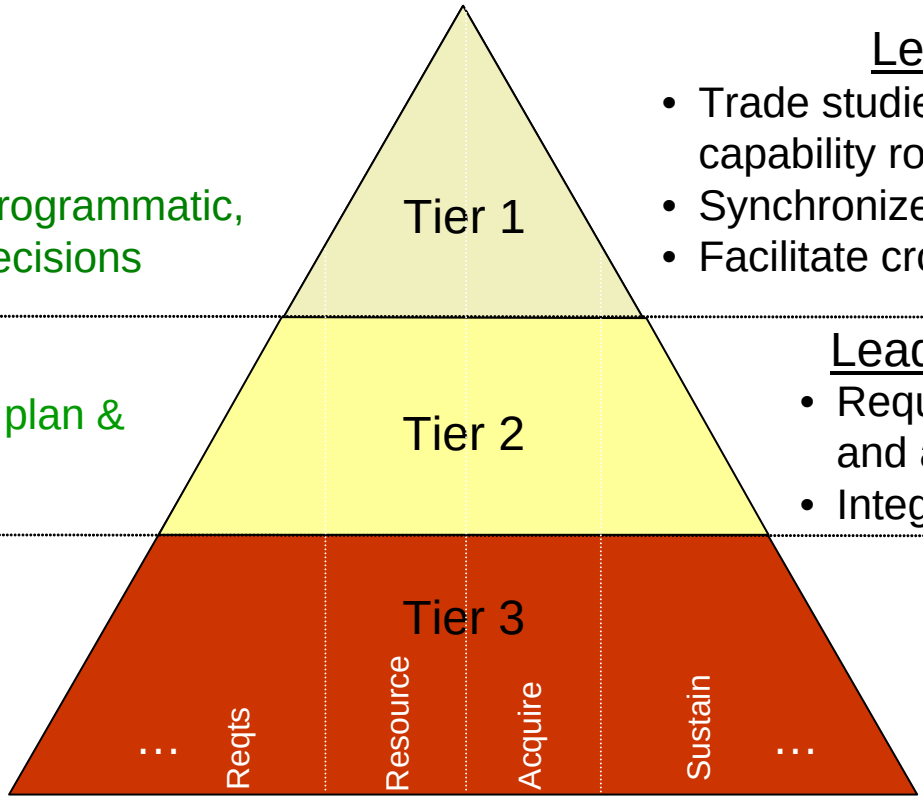
- Translate a BC technical vision for Service implementation to operational capabilities
  - *Converging current and future force service strategies*

System of Systems



- Execute technical vision through a System of Systems engineering and integration approach
  - *Extending to an ASAALT-led cross Army approach*

Instituting Cross-Army SoS Engineering



Vision, programmatic, policy, decisions

Execution plan & resolution

Execution/ Solution

Lead: ASAALT

- Trade studies and analysis in support of capability roadmaps
- Synchronize enterprise level development
- Facilitate cross-portfolio issue resolution

Lead: ASAALT with PEO SoSE

- Requirements flow down, decomposition, and adjudication
- Integrated schedule and CM

Lead: PEOs

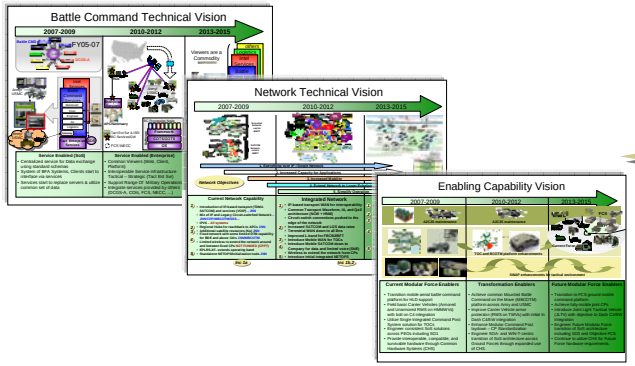
PEO/PM SoS Engineering Teams:

- Technical Execution, Implementation
- Trades supported by R&D Community

Managing depth and breadth of SoS Engineering issues vertically (within) and horizontally (between) C4ISR capability portfolios

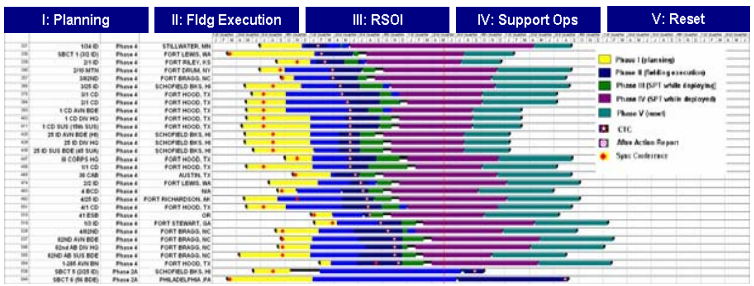
An S&T Innovator's Response

Adapting to the BC SoS Challenge



S&T Transition Challenge

- ***Establish a Shared Vision***
  - Demonstrate operational understanding of the Warfighting domain
- ***Create Product Partnerships***
  - Partner with high impact programs to fill critical technical/operational gaps

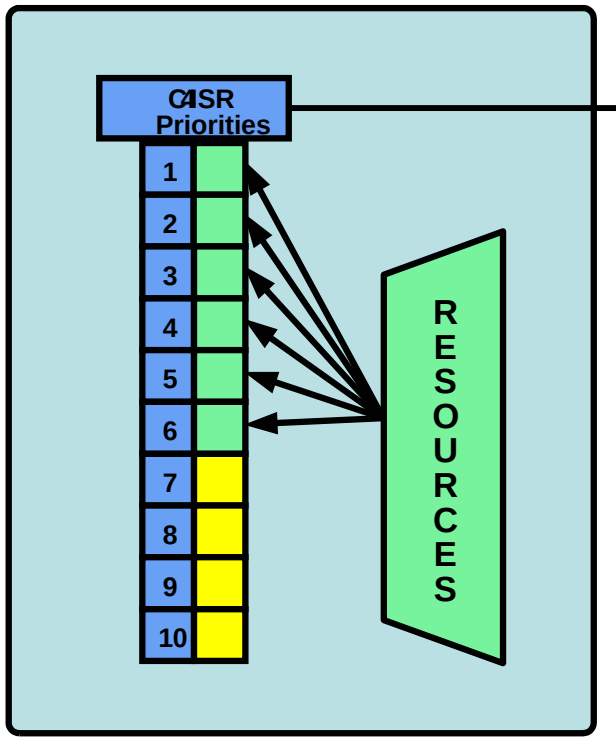


- ***Align Execution Processes***
  - Link S&T solution rollout with aggressive Modular Force capability block development and fielding

Evolution v. Revolution in fiscally constrained environment

Prioritizing Tactical C3 S&T Execution

PEO C3T Top 20 S&T Priorities



Technology Transition Matrix (T2Matrix)

T2Matrix
Technology Transition Matrix
GOTS, Developed by PEO C3T

Technical Gaps - View All

View by S&T Projects | ADD A GAP | REPORTS | Show Gaps Using Preferences | CONTROL PANEL

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PEO	PEO Priority	PM	PM Priority	$	Gap Title	Program Type	S&T Projects	Transition Stage	Date
C3T	1	SE&I	1		Enhancing C2 in a Counter Radio Control (RC) IED Environment	DARPA (Ph III)	neXt Generation Communications (XG)	Proposed	27FEB2007
						DARPA (Ph IV)	Chip Scale Atomic Clock (CSAC)	MOA (Draft)	02NOV2007
						JCTD	Coalition Joint Spectrum Management Planning Tool (CJSMPT) JCTD	TTA (Approved)	21MAY2007
C3T	2	SE&I	3		Application Controlled Quality of Service (QOS)	ATO-D	Tactical Information Technologies for Assured Network Operations (TITAN)	TTA(Draft)	23JUL2007
						SBIR Phase I	Commercial Wireless DoS Mitigation Techniques	Agreement	27JUL2007
						SBIR Phase II	Adaptive Bandwidth Service (ABS)	PEO Endorsed	30MAR2007
C3T	3	SE&I	2		Tactical Cross Domain Solutions (TCDS)	ATO-D	Tactical Information Technologies for Assured Network Operations (TITAN)	TTA(Draft)	23JUL2007
C3T	4	WIN-T	1		Affordable OTM Antenna Technologies	ATO-D	Affordable Directional Antenna Program Technologies (ADAPT, TNCA ATO[D])	TTA (Approved)	13JUN2006
						ATO-D	Affordable Low Profile SATCOM OTM (ALPS)	Proposed	17OCT2007
						ATO-D	Antenna Technologies (AT, TNCA ATO [D])	PEO Endorsed	08AUG2005
						ATO-R	Breakthrough Antenna Technology (BAT)	Proposed	17OCT2007
						SBIR Phase I	High Efficiency, Low Power, Low Noise Amplifiers for SATCOM	Agreement	27JUL2007
						SBIR Phase II	Ballistic Radomes for SATCOM Antennas	Agreement	01MAY2006
						SBIR Phase II	Distributed & Flex Based Spatially Combined mHEMT PA for SATCOM	Agreement	04MAY2007
						SBIR Phase II	Dual Band X/Ka OTM Antenna System	Agreement	04MAY2007

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Top 4 PEO C3T Technology Gaps

https://t2matrix.kc.us.army.mil

Institute an open process to align limited S&T resources with prioritized operational needs and increase transition successes

Transitioning S&T Solutions to PORs

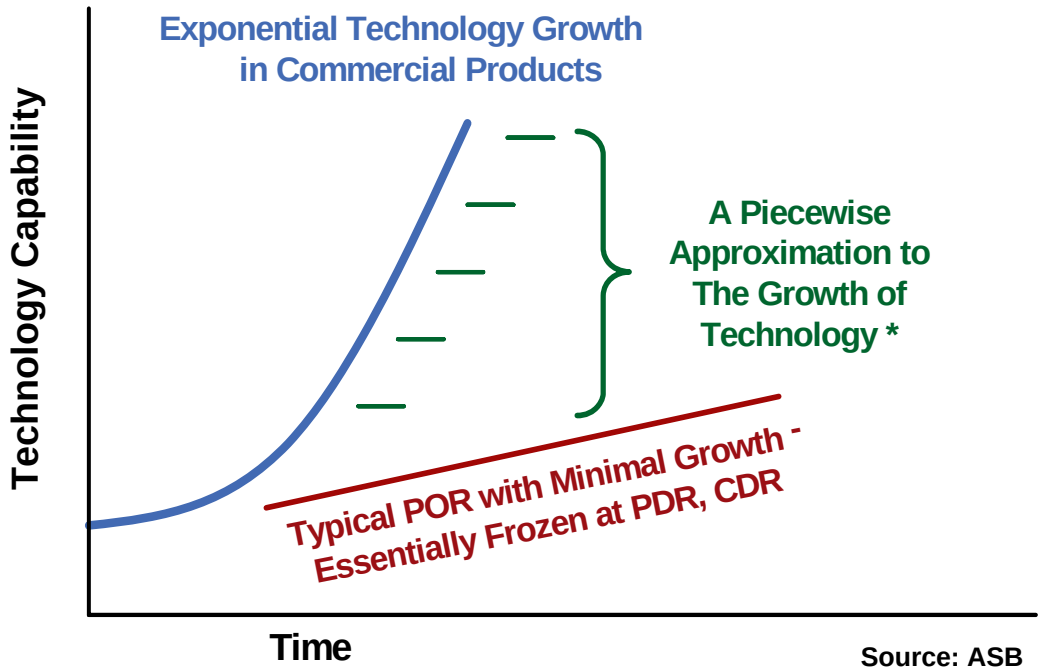
Challenges

–*"Operationalizing"*

- Delivering Warfighter-Focused v. Technology Policy-Driven Solutions

–*Execution Ownership*

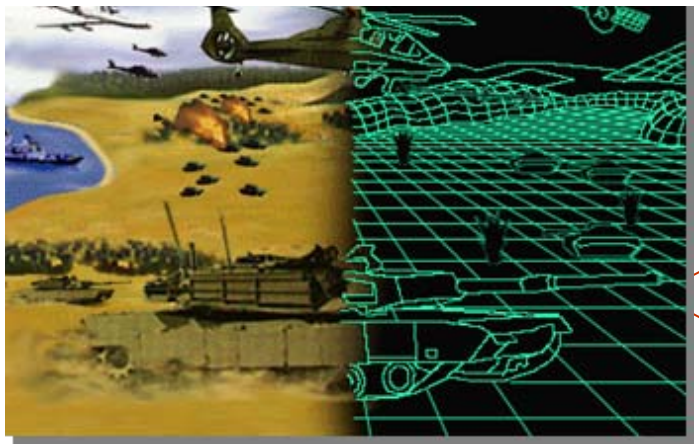
- Strategizing with PMs early (and often) on S&T transition



Advancing C4ISR SoS M&S Capabilities

- Integrated C4ISR Live/Virtual/Constructive Demonstrations and Analyses
  - Enables C4ISR System of Systems Engineering analyses of greater scale and accuracy
  - Relevant across the spectrum of program life cycle
  - More quickly, more efficiently, resulting in significant cost savings/avoidance

Analysis of operational data collected in-theater and used in M&S enabled bandwidth assessments

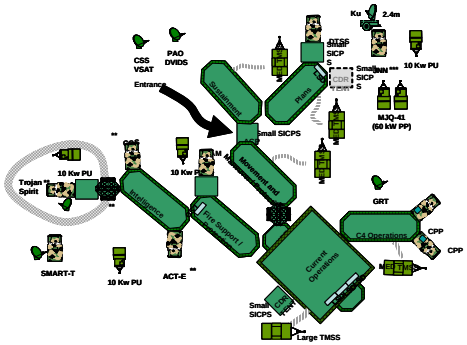


High-Performance-Computing Army Laboratory for Live/Virtual/Constructive Experimentation (H.A.L.L.E.)

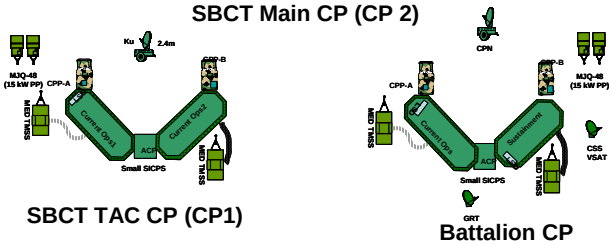
Insertion of realistic C4ISR effects into live experimentation environments

Instituting Operational Design Reviews

- TOCFEST
  - Team C4ISR engineering field study to validate the current Command Post SoS from 11 Mar to 13 Apr 2008 at Fort Indiantown Gap, PA (FTIG)



SBCT Main CP (CP 2)



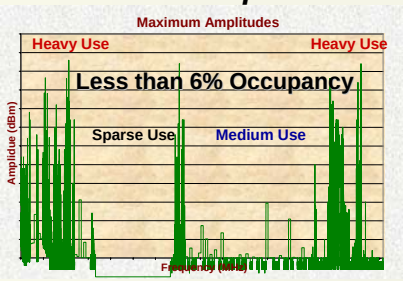
SBCT TAC CP (CP1)

Battalion CP

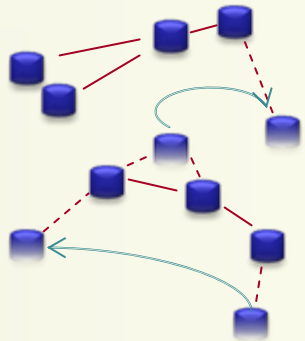
Standardizing Command Post baseline architecture – *physical and logical*
Evaluating technical and operational effects of configuration changes
Setting conditions for ongoing C4ISR SoS operational design reviews

Selected BC Enabling Technologies

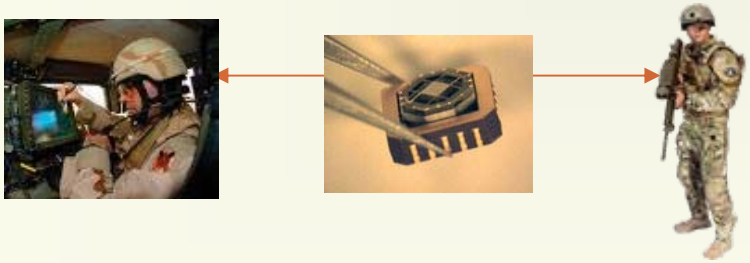
- **neXt Generation Communications (XG) Dynamic Spectrum Access Technology**
  - *Maximize access to and use of required tactical spectrum*



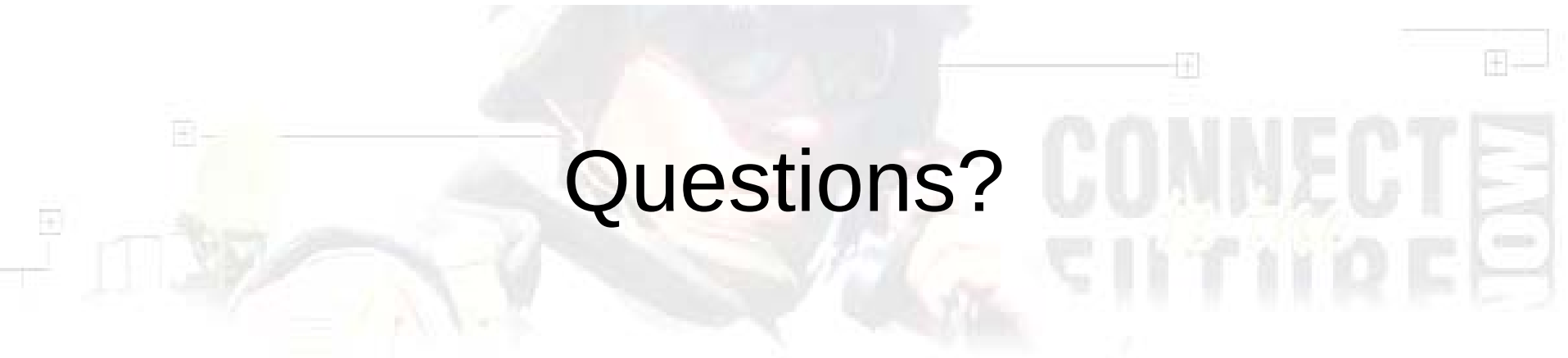
- **Disruption Tolerant Networking (DTN)**
  - *Assure tactical C2 info delivery when no network path exists*



- **Chip Scale Atomic Clock**
  - *Deliver precise timing and positioning for the "last tactical mile"*



- **Serious Gaming**
  - *Enhance C4ISR training environments, linking Command Post capability usage with realistic tactical scenarios*



Questions?