The Whitfill Central Technical Support Facility (CTSF) Conducts System of System (SoS) Tests in a Net-Centric Environment Achieving Interoperability for the Army(U)

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CECOM LCMC Life Cycle Management Command

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Agenda (U)

- What is the CTSF?
- What is interoperability?
- What is Army Interoperability Certification (AIC)?
- What are the entrance criteria and test timeline?
- Mission Thread 101
- How do we schedule system of system testing?
- How do we test interoperability?

What is the CTSF ? (U)

- The CTSF is the Army's systems of systems interoperability integration and certification facility for Army LandWarNet/Battle Command (LWN/BC) systems.

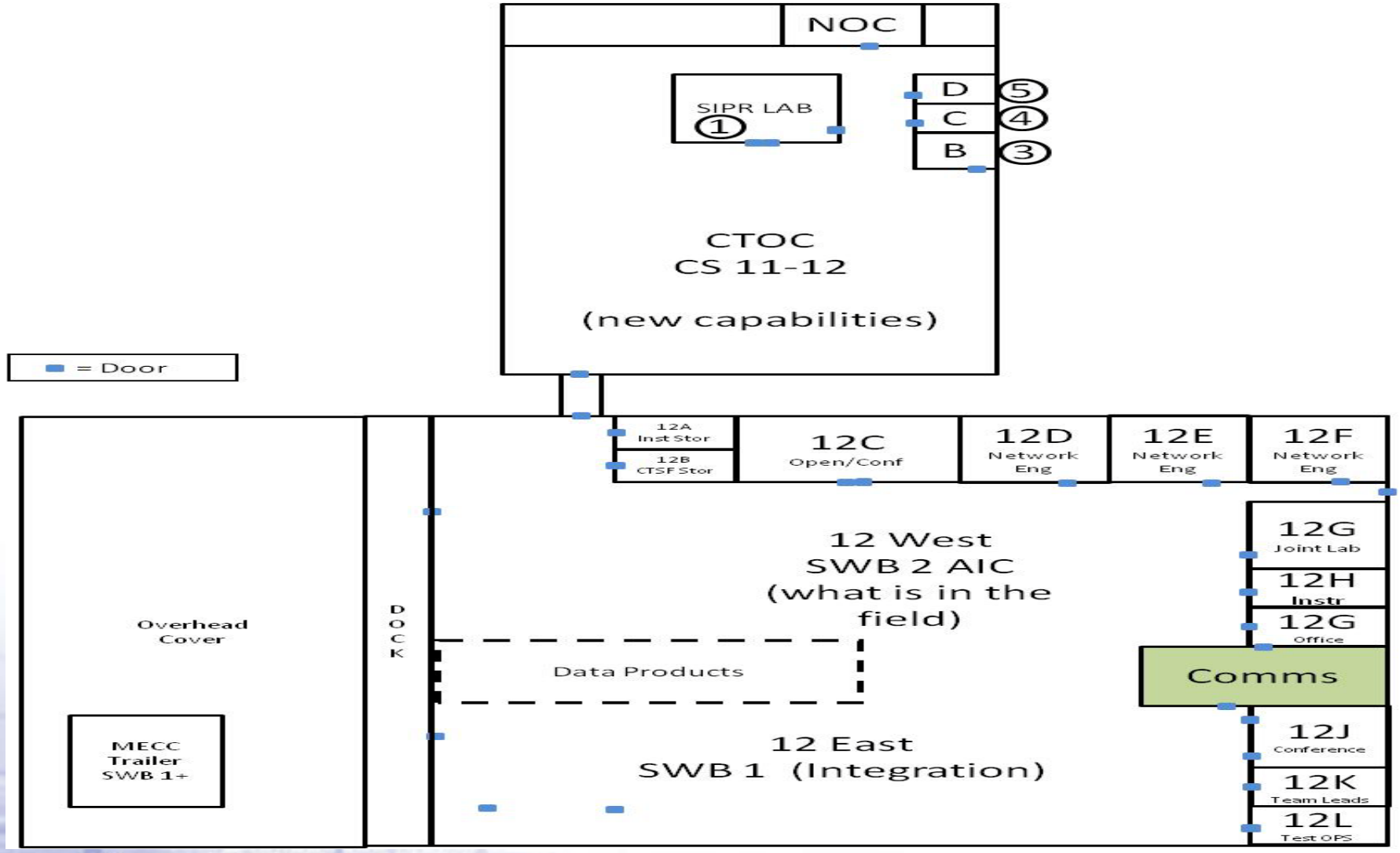
- Integration and testing efforts at the CTSF are focused on assisting and facilitating PM and PdM efforts to deliver integrated systems of systems capability sets to the Warfighter.

- 250k Sq Ft Facility (41k Sq Ft instrumented testing and integration), 30 temporary buildings on 11 acres on Fort Hood, TX.

- The core staff is 233 people, plus the CTSF houses 400+ representatives from Army staff, PEOs/PMs, and vendors.

Bottom Line: "Achieving Interoperability for the Army"

CTSF Interoperability Test Floors (U)



What is Interoperability? (U)

The ability of Information Technology/National Security System (IT/NSS), Units, or Forces to successfully digitally exchange secure and timely data, information, materiel, and services, to enable them to operate effectively and efficiently together, thus achieving information superiority.

What is Army Interoperability Certification? (U)

- AIC applies to all Army Information Technology (IT) & National Security Systems (NSS) prior to release to the field, to include:
  - All Mission Areas/Domains
  - All Acquisition Categories (ACATs)
- The USA CIO/G-6 is the AIC Certification Authority (CA) – Subtitle III of Title 40, United States Code, as Amended (formerly Division E of the Clinger-Cohen Act of 1996)
  - CTSF is the Test Agent that executes AIC on behalf of and under the direction of the USA CIO/G-6

What are the AIC Entrance Criteria? (U)

- AIC Entrance Criteria:
  - Program Manager's signed AIC Request to Test letter
  - Configuration Control Board approval by Assistant Secretary of the Army (Acquisition, Logistics, Technology) ((ASA(ALT) and G-3
  - Approved Information Support Plan (ISP), Tailored ISP, or ISP Waiver
  - User/Proponent/MATDEV community coordinated and approved Mission Threads to include backwards capability/interoperability, as applicable
  - Approved Authority to Operate (ATO)/ Interim ATO for the system

What are the AIC Entrance Criteria? (U) Continued

- AIC Entrance Criteria (continued):
  - Configuration/version control during AIC testing
  - Ensure and demonstrate compliance with current Information Assurance Vulnerability Alerts and anti-virus patches
  - Provide developmental integration/testing reports showing severity levels and open faults
  - Provide appropriate level of funding to the AIC Test Agent
  - Provide concurrence to the US Army CIO/G-6 approved Test Plan

Test timeline for an AIC (U)

T-180	T-90	T-30	T-0	T+30
New System: ❑ TCM sends Mission Threads to TRADOC for staffing	**Existing System:** ❑ TRADOC posts approved Mission Threads ❑ PM sends CCB request to ASA(ALT)	**All Systems:** ❑ CRR (Certification Readiness Review): ❑ HW Delivery ❑ SW Delivery ❑ ATO Status ❑ SVD/VDD, Release Notes ❑ Install/Configuration ❑ Funds sent to CTSF Budget ❑ PM/TCM/Test Officer (TO) Test Plan review, comment, and concurrence ❑ Test Operator Training ❑ SoSI Checkout of Install/Config docs and Release Notes ❑ IA scans; must pass before can connect to CTSF network	**All Systems:** ❑ TO writes TIRs, if applicable ❑ DAG discusses TIRS and submits Severity Level recommendation to ESC (Fridays, 0900) ❑ ESC reviews and scores TIRs (Fridays, 1030) T-0+ ❑ PM/TCM submits 06 signed memos, Tech Bulletins (TB) ❑ TO validates TB and updates TIR for ESC	**All Systems:** ❑ TO writes Test Report ❑ ORSA reviews and staffs report for CTSF Director's signature ❑ Tech Writer posts signed report to AKO for CIO/G-6 and remainder of Test Community

Mission Thread 101 (U)

- Mission Threads combine information from Operational View (OV)and System View (OV) Department of Defense Architecture Framework (DoDAF) products, to include the baseline's Technical View (TV) into an integrated into a product.

- Threads are used to depict data/information exchanges required to accomplish operational requirements with current or future system functionality to accomplish the mission.

- Threads address the 'what' to test in a system of system construct
  - Follows through echelons (Company, Battalion, Brigade, Division. Corps, Theater) – generic and can be applied to any unit
  - May change data format/protocol several times

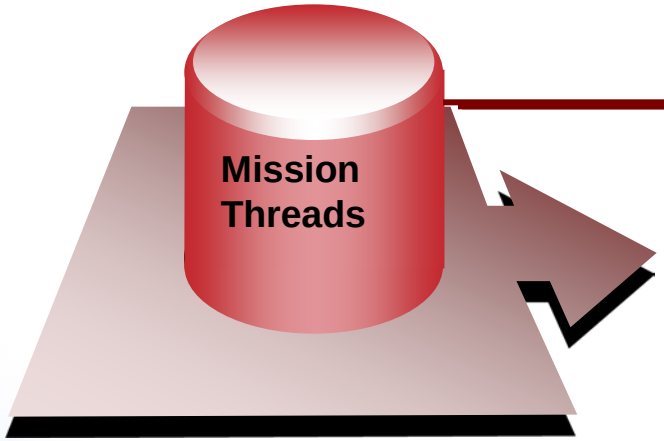
Mission Threads 101 Continued (U)

- System TCM/PM reps build threads based on system operational and architecture requirements through collaboration / integration of:
  - Operational Requirements Developers-Warfighter / User
  - Combat Developers System Functions
  - Program Executive Office Product / Program Managers
- Threads are configuration managed and community coordinated for consensus by TRADOC
- Threads can be used to determine
  - S/W shortfalls, Interoperability shortfalls, Operational shortfalls
  - Cause and effect relationship
  - Future implementation/capabilities

Mission Thread Inputs and Outputs (U)

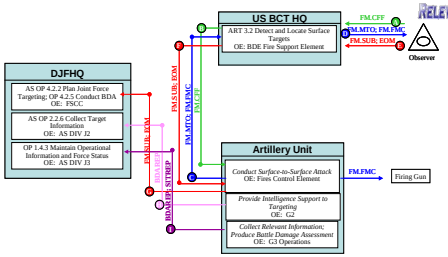
Inputs

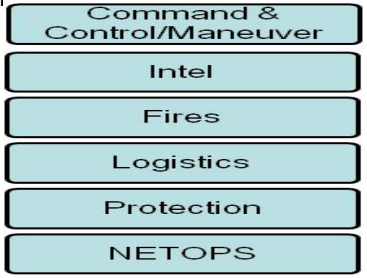
Doctrine
System Functions
Communications Means
Nodes / Organization
Information Requirements

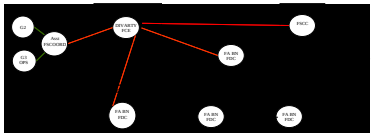


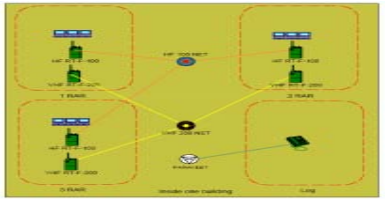
Outputs

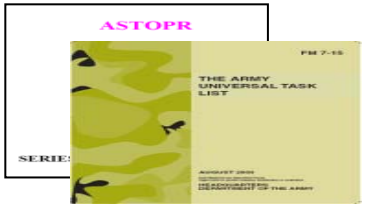
- Exercise/ Testing
- Information Exchanges
- Node Connectivity
- Network Architecture
- Training/ Task Lists











GAP ANALYSIS

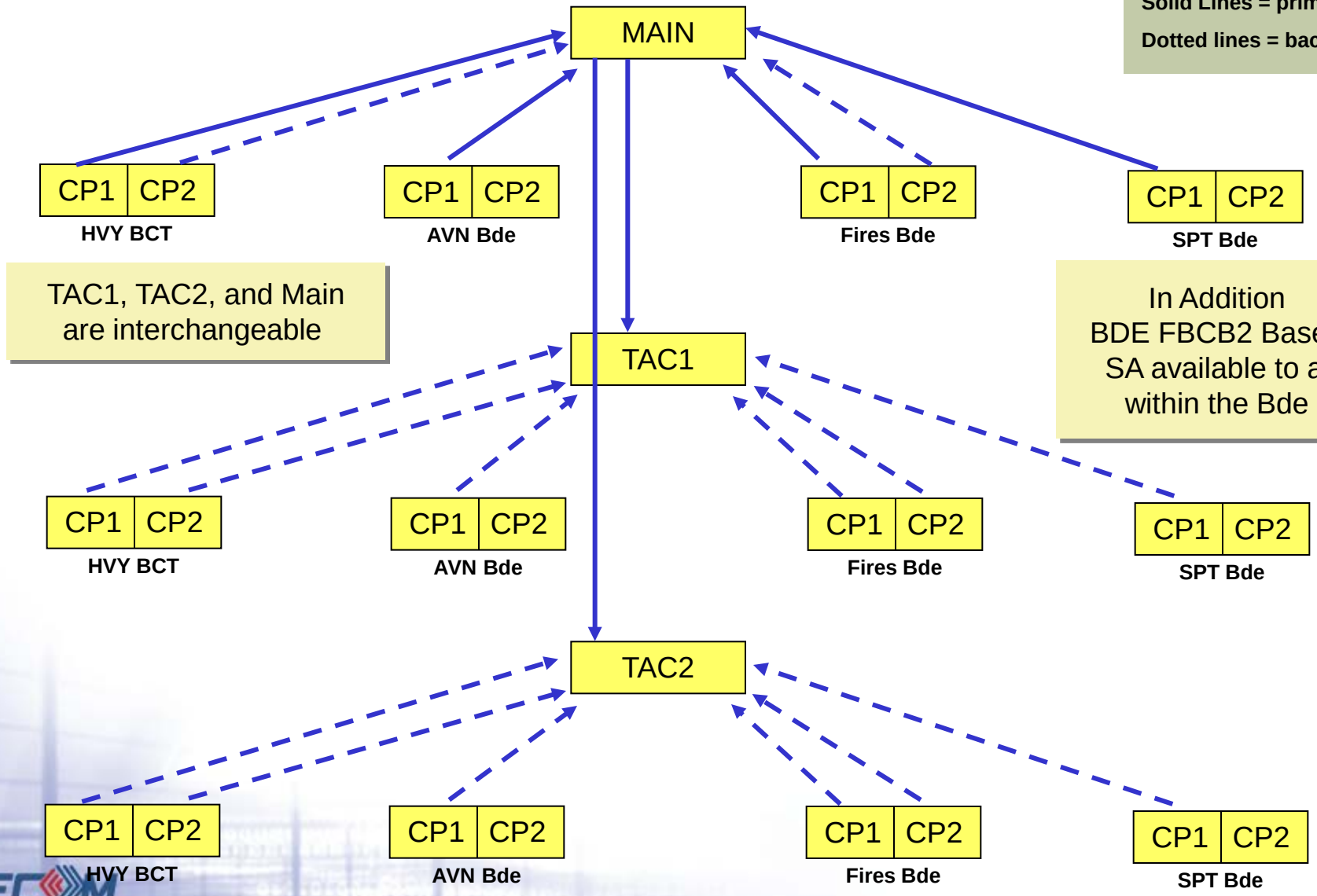
-Threads provide tools
- Threads provide interoperability baseline.
- Prototypes and new systems can then be tested against the baseline.

Mission Thread: Blue Situational Awareness (U)

Lower-to-Higher Dissemination

Solid Lines = primary

Dotted lines = backup



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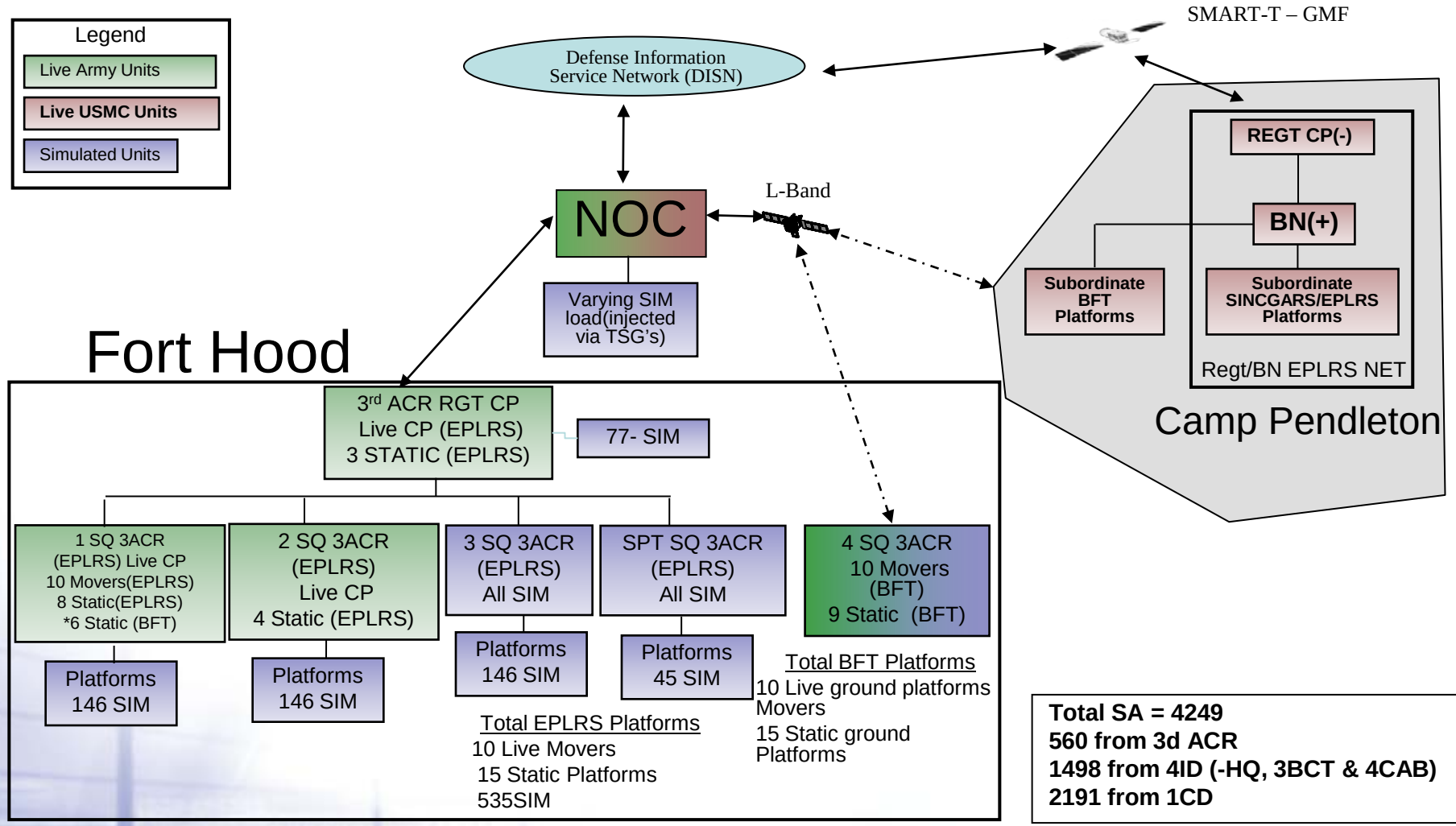
ATEC JCR Field Test & CTSF Integration & Interoperability Event (I2E) (U)



Total SA = 4249
560 from 3d ACR
1498 from 4ID (-HQ, 3BCT & 4CAB)
2191 from 1CD

CTSF Schedule CY 2010 (U)

SWB2 CY 2010 Tri-Annual Schedule – Software Updates for Fielded Baseline										
Jan 10	Feb 10	Mar 10	Apr 10	May 10	Jun 10	Jul 10	Aug 10	Sep 10	Oct 10	Nov 10
SWB2 Test-1 Record Test	SWB2 Test-1 Report	SWB2 Test-2 Plan	SWB2 Test-2 Integration	SWB2 Test-2 Record Test	SWB2 Test-2 Report	SWB2 Test-3 Plan	SWB2 Test-3 Integration	SWB2 Test-3 Record Test	SWB2 Test-3 Report	SWB2 Test-3 Report

12 Systems with SW Updates

17 Systems with SW Updates

		CS11-12 CY 2010 Tri-Annual Schedule – New Software Baseline								
Jan 10	Feb10	Mar 10	Apr 10	May 10	Jun 10	Jul 10	Aug 10	Sep 10	Oct 10	Nov 10
Integration	Integration	Integration	Integration	Record Test	Record Test	BWC Test	CS11-12 Report	CS11-12 T-1 Plan	CS11-12 T-1 Integration	CS11-12 T-1 Record Test

BWC – Backwards Compatibility Testing between new software baseline and the fielded baseline

CTSF: Achieving Interoperability for the Army (U)
2009 Actual Schedule

SWB2 CY 2009 Tri-Annual Schedule – Software Updates for Fielded Baseline					
Jan 09	**Feb 09**	**March 09**	**April 09**	**May 09**	**Jun 09**
SWB2 Test -1 **Record Test**	**SWB2 Test-1** **Report**	**SWB2 Test-2** **Plan**	**SWB2 Test-2** **Integration**	**SWB2 Test-2** **Record Test**	**SWB2 Test-2** **Report** **SWB2 Test-2.5 Plan**

18 Systems with SW Updates tested in a System of System Architecture

15 Systems with SW Updates tested in a System of System Architecture

CTSF: Achieving Interoperability for the Army (U) 2009 Actual Schedule

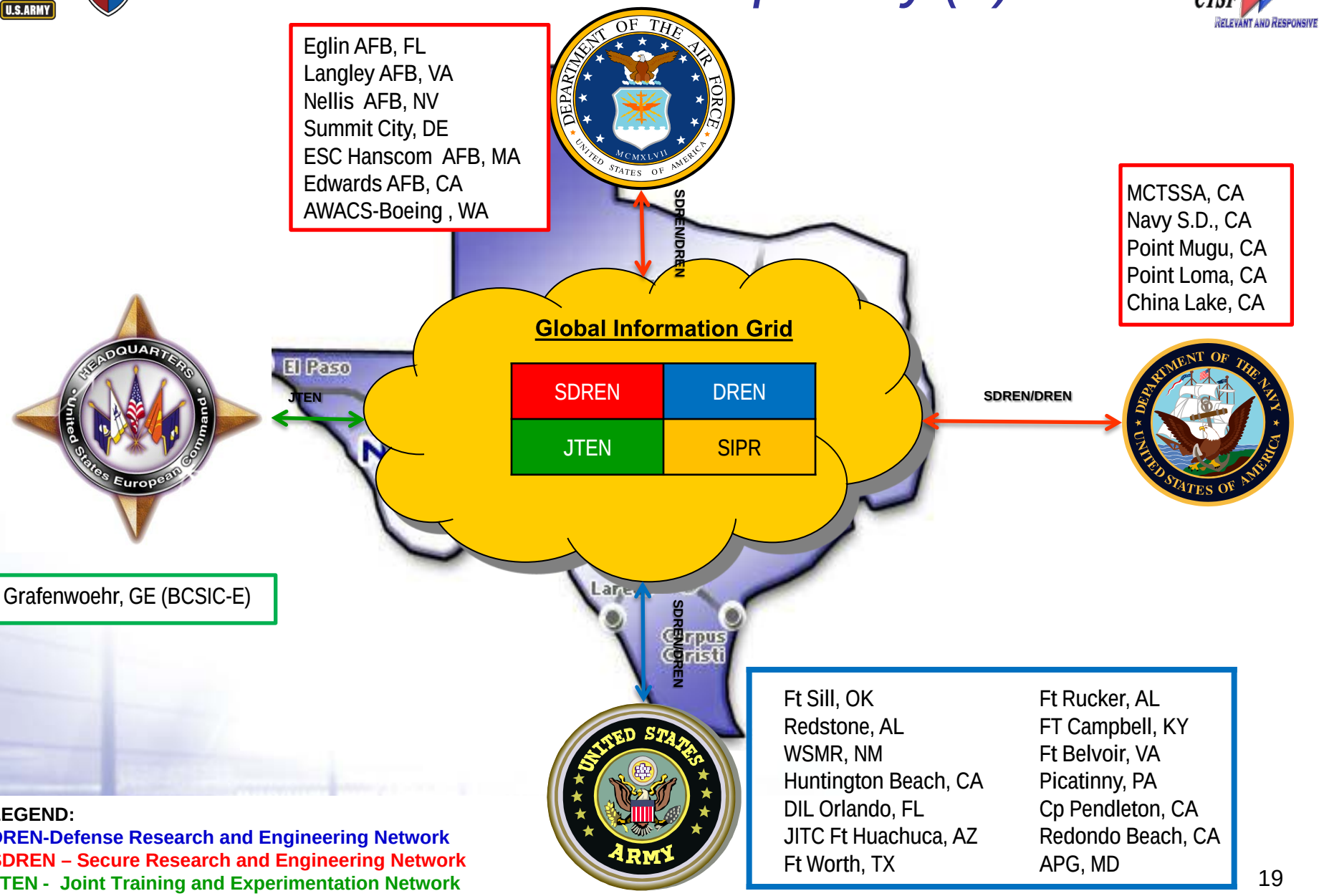
SWB2 CY 2009 Tri-Annual Schedule – Software Updates for Fielded Baseline					
Jul 09	**Aug 09**	**Sep 09**	**Oct 09**	**Nov 09**	**Dec 09**
SWB2 Test -2.5 **Test (Moved from Sep to meet an Operational Requirement)**	**SWB2 Test-2.5** **Report**	**SWB2 Test-3** **Plan and Integration**	**SWB2 Test-3** **Record** **(Moved test from Sep to accommodate Jul Test)**	**SWB2 Test-3** **Report**	**SWB2 Test-** **Plan and Integration**

21 Systems with SW Updates tested in a System of System Architecture

17 Systems with SW Updates tested in a System of System Architecture

Total SW Updates in 2009: 71

CTSF Distributed Capability (U)



LEGEND:
DREN-Defense Research and Engineering Network
SDREN – Secure Research and Engineering Network
JTEN - Joint Training and Experimentation Network
SIPR – Secure Internet Protocol Router

Distributed Testing of Interoperability (U)

MCS WS
BC SVR

AVN BDE
FECC

DCGS-A

Connectivity

Maneuver BN

Fort Hood

Fort Monmouth

DREN

Redstone Arsenal

Fort Sill

AO
KIOWA

SINCGARS

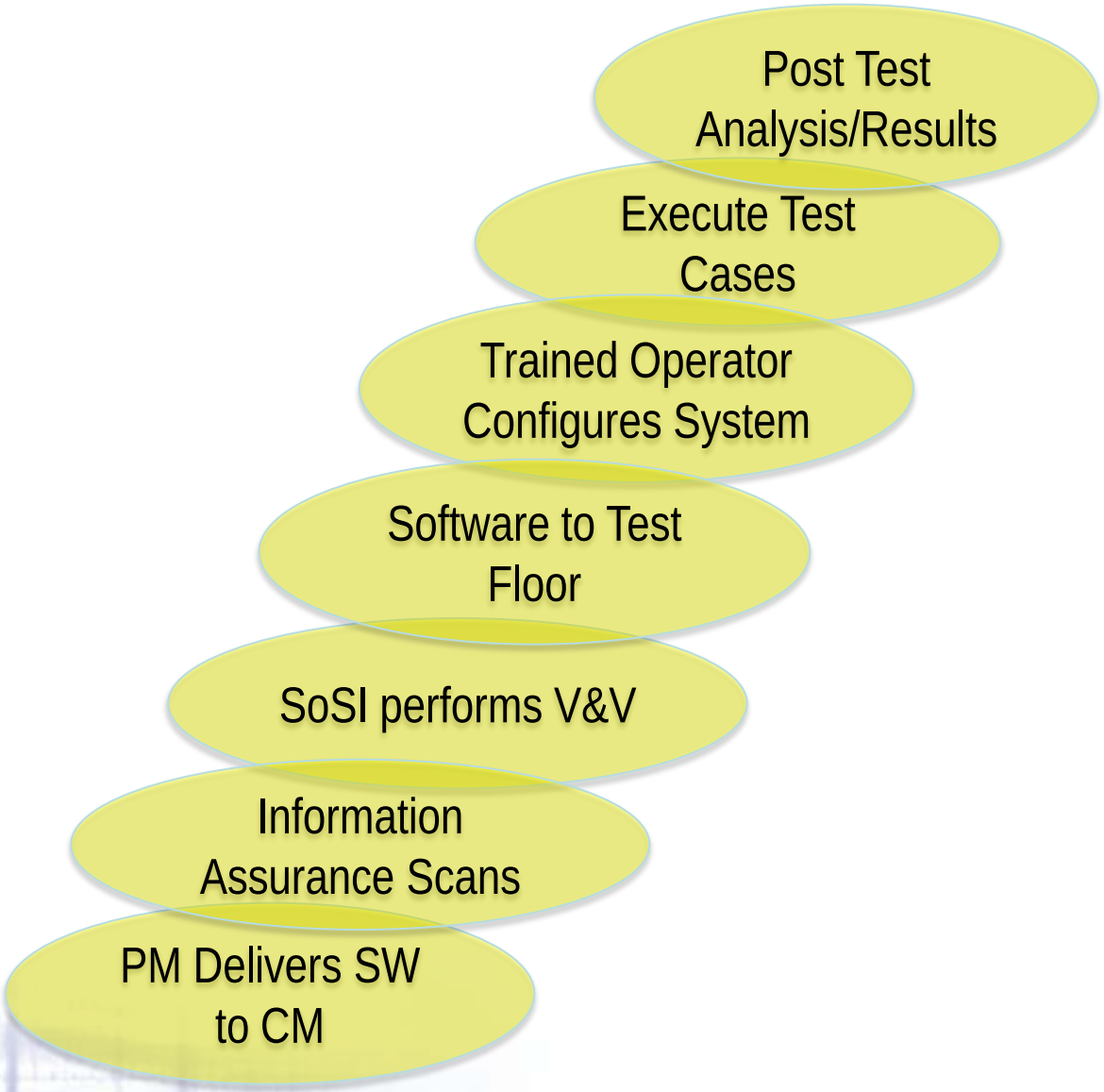
BN AFATDS and FOS
AVN

155MM SIM

SINCGARS

BTRY FDC

Software's Path to AIC



Customers (U)

- HQDA Staff (CIO/G6, G3, ASAALT)
  - Army Interoperability Certification Testing (AIC).
  - Interoperability Capabilities and Limitations Assessment (IC&L).
- Customer Testing
  - Data Product (IP Address Book) Validation for Crypto Network Initialization (CNI)
- Integration Testing
  - Integration and Interoperability Event (I2E) for ASA (ALT)
  - System of System Interoperability for Program Managers
- Warfighter
  - Replicate issues found with networks or systems and provide a solution or workaround until PM delivers new capability

Army - Joint - Industry -Teamwork (U)

CECOM LCMC
One Vision, One Mission - The Warfighter.

UNIVERSITY XXI

DCS G-3/5/7
THE CENTER OF THE UNIVERSE

AMC/RDECs

CERDEC
US ARMY – RDECOM

SERVING OUR ARMY AT WAR
CTSF
RELEVANT AND RESPONSIVE

TEST COMMUNITY

AGC

TRADOC/Battle Labs

46TH TEST GROUP

UNITED STATES JOINT FORCES COMMAND
JSIC
JOINT SYSTEMS INTEGRATION COMMAND

JFCOM
JSIC
JITC

BCSIC-E

MCTSSA
Marine Corps Tactical Systems Support Activity

BRIDGING THE GAP
DARPA
POWERED BY IDEAS
DEFENSE ADVANCED RESEARCH PROJECTS AGENCY
FEBRUARY 2005

SPAWAR

Together, CTSF, PMs, TRADOC, and DA Staff (U):

- Formed teams that ensure Operational Requirements are associated with System Functionality in Testing & Evaluation Events.

- Developed a collaborative Test / Evaluation Process that builds in Warfighter's Requirements achieving interoperability as System of System information exchanges - Mission Thread.

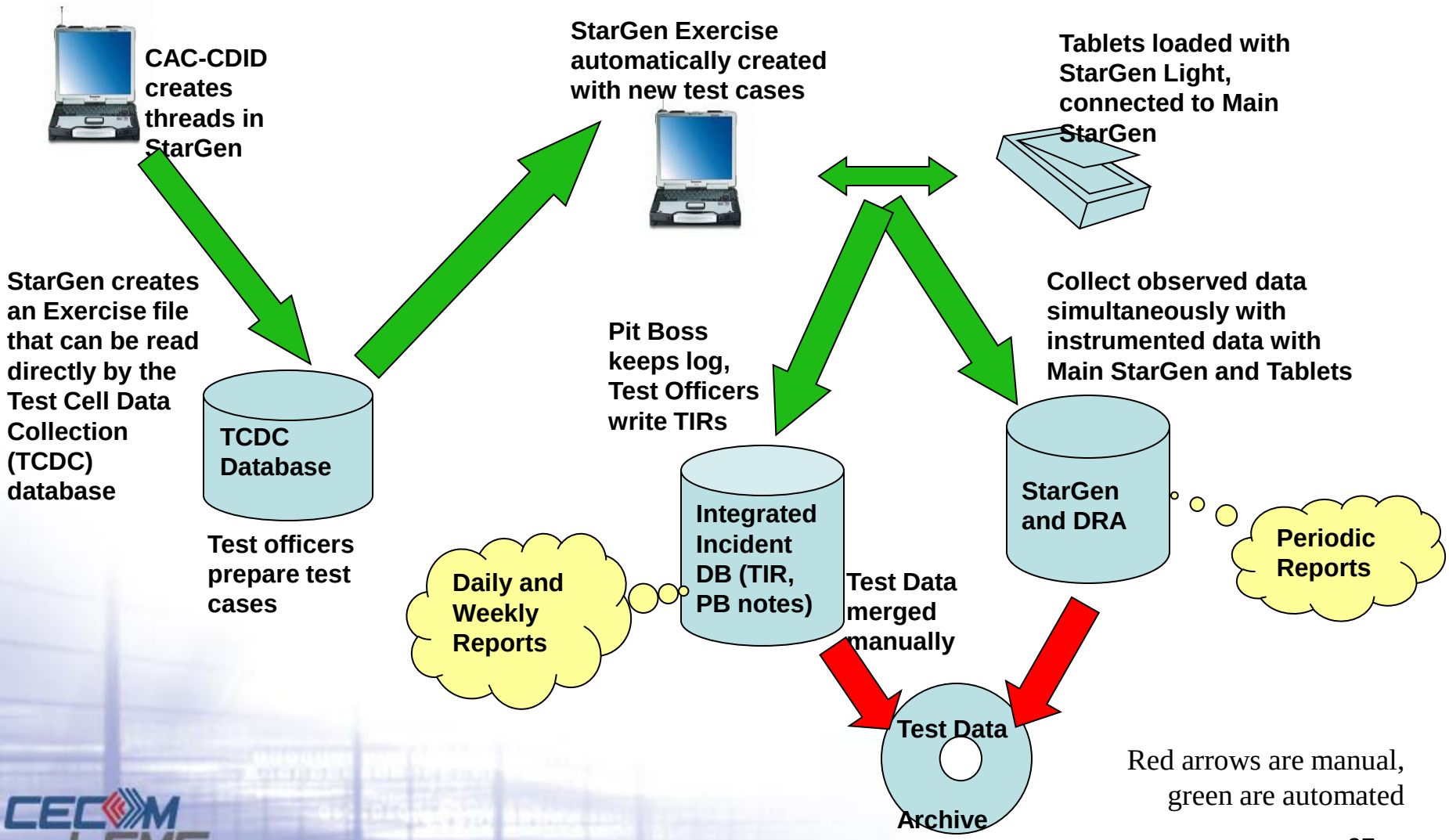
- Established a repository of Threads for use in numerous Army, Joint, and Service events - reusable products that save resources in the long-term.

- CTSF campus conducts PEO/PM development, integration, testing, and training.

Questions?

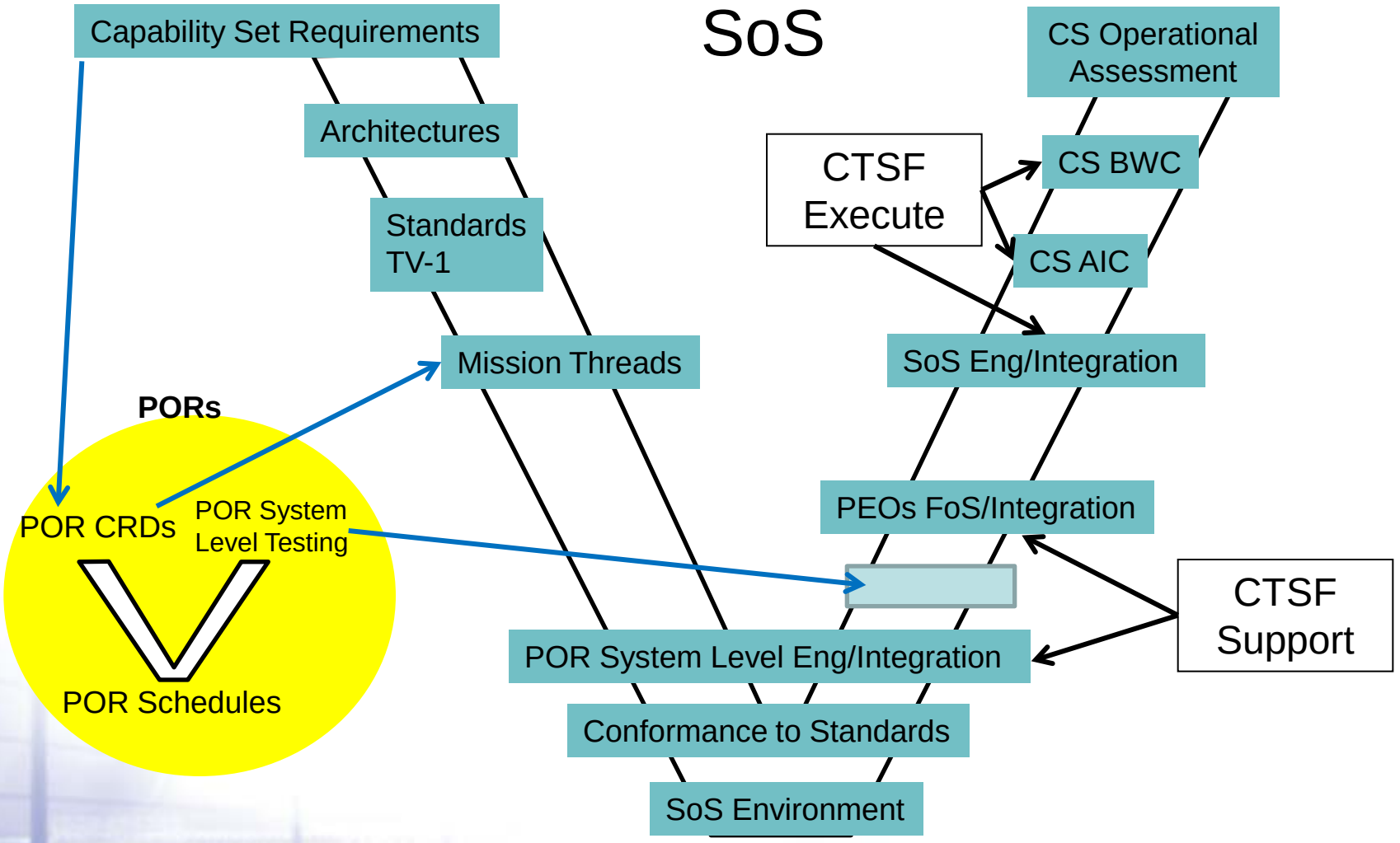
Backup Slides

Data Management Process (U)



Red arrows are manual, green are automated

Where CTSF Fits



CTSF AIC Rating (U)

- IEEE 12207 – TIR definition
- The CTSF does not make AIC recommendation
- Risk analysis considers technical and operational input
- CTSF AIC Summary Test Report written after every test event
  - Interoperability Indications in Summary Test Report:
    - Interoperable: No Severity Level 1 or 2 TIRs -OR- Level 2 TIR with TCM input of low operational risk
    - Not completely interoperable: Level 2 TIRs -AND- TCM input to assessment indicates medium operational risk
    - Limited interoperability: Level 2 TIRs -AND- TCM input indicates serious operational risk
    - Not interoperable: Catastrophic failure -OR- issues unacceptable to TCM (high operational risk) -OR- TCM will not provide user input

Test Incident Reports (U)

TIR Severity Levels (SL)		
SL		**Description**
1	a)	Prevent the accomplishment of an essential capability.
	b)	Jeopardize safety, security, or other requirement designated "critical."
2	a)	Adversely affect the accomplishment of an essential capability and no work-around solution is known.
	b)	Adversely affect technical, cost, or schedule risks to the project or to life cycle support of the system, and no work-around solution is known.
3	a)	Adversely affect the accomplishment of an essential capability but a work-around solution is known.
	b)	Adversely affect technical, cost, or schedule risks to the project or to life cycle support of the system, but a work-around solution is known.
4	a)	Result in user/operator inconvenience or annoyance but does not affect a required operational or mission-essential capability.
	b)	Result in inconvenience or annoyance for development or maintenance personnel but does not prevent the accomplishment of the responsibilities of those personnel.
5		Any other effect.

AIC Authorities (U)

- CJCSI 6212.01E, 15 Dec 08
- SA/CSA Army Battle Command Domain, 30 Nov 05
- AR 25-1, 15 Jul 05
- AKM Guidance Memorandum–Capability Based Information Technology Portfolio Governance Implementing Guidance, 22 Jul 05
- DoDI 4630.8, 30 Jun 04
- DoDD 4630.5, 05 May 04
- AR 70-1, 31 Dec 03
- DA-PAM 73-1, 1 Aug 06
- DoD 5000.1/2,
- Clinger-Cohen Act 04 1996 (Title 40, P.L. 104-106), Sec. 502 (c)(1)(C), 41 USC 434
- Intra-Army Interoperability Certification (Hoeper/Cuviello) Memorandum, 03 Dec 00
- DoD 8320.2, 12 Apr 06

BCCOA Products (listed) (U)

Department of Defense Architecture Framework (DoDAF) Products

All View (AV)-1 – Executive Summary, Scoping Statement Purpose
AV-2 Integrated Dictionary
Operational View (OV) – 1 Concept Diagram
OV-2 Node-to-Node Connectivity Descriptions (3 variants)
OV-3 Information Exchange Requirements (IERs) Matrices
OV-4 Organizational Relationships
OV-5 Activity Models

BCCOA Development Process

8 separate but fully integrated Activity Models and related products (from JTF HQs to Company & Below)
Based on operational requirements (AUTL & UJTL) vice organizational constructs

CTSF uses C3 Driver for Test Instrumentation Tool (U)

C3 Driver

Runs on COTS Hardware

Combines the Power of ATEC and PM ITTS Tools

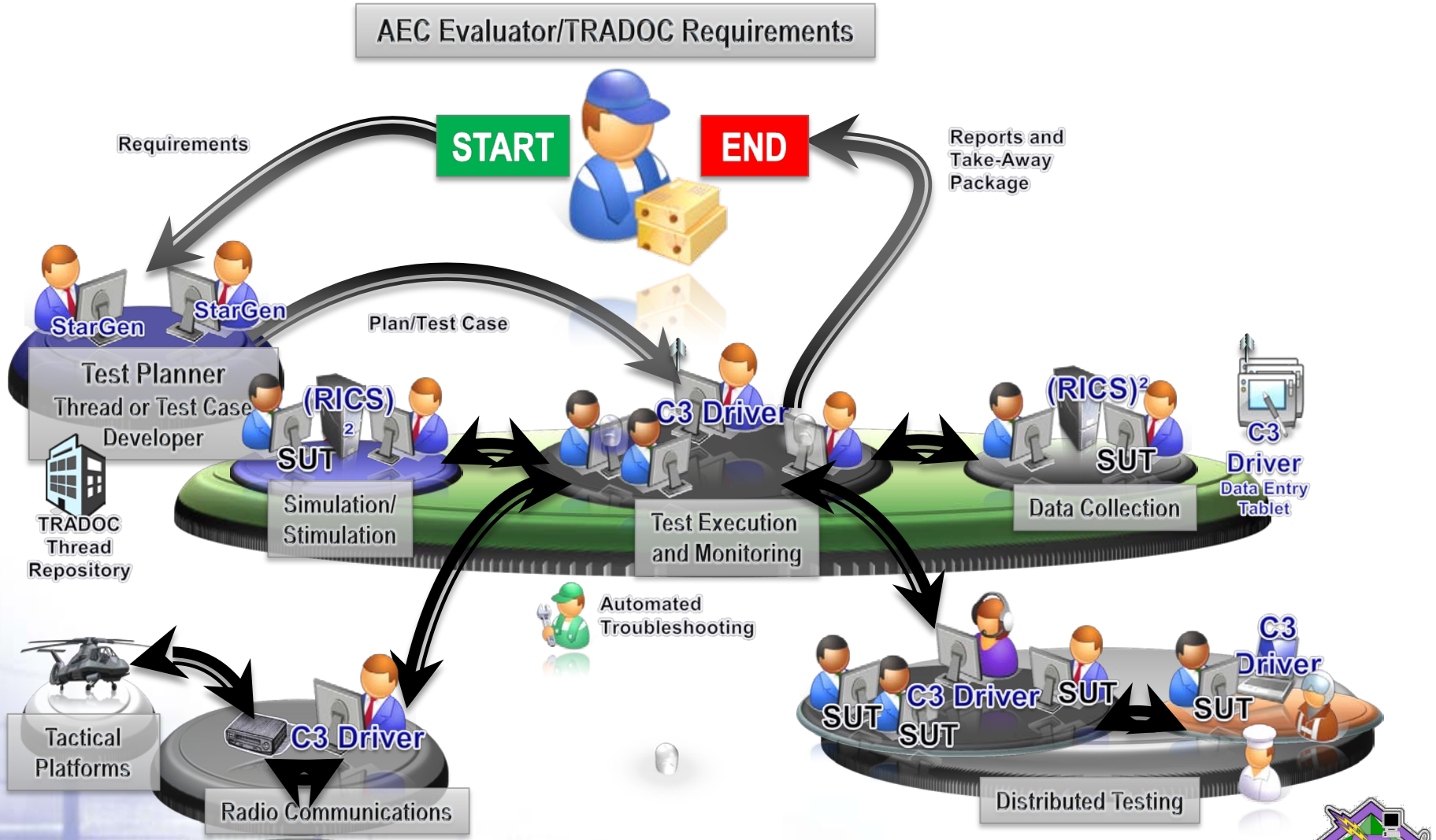
ATEC

- Collection
- Reduction
- Analysis
- Simulation

PM ITTS

- Planning
- Instrumentation C2
- Monitoring

C3 Driver Instrumentation – Operational View (U)



ATEC Instrumentation Advantages (U)

- Superior test planning and management tools
  - True automation of critical functions
- Mature ATEC tools that:
  - Focus on military messages and protocols
  - Support real-time collection, reduction and analysis
  - PMs use in development of some LWN/BC systems and platforms
    - Helps ensure that tools are ready when systems arrive at CTSF
  - Provide doctrinally accurate simulation for:
    - SA & C2 traffic load
    - Traffic injection points
    - Time and location for LWN/BC systems

ATEC Tools are Widely Used (U)

- Currently there are 81 customers
  - 23 Test related customers including
    - JITC, Joint Data Integration (JDI), InterTEC, MCTSSA, PEO STRI DIL
  - 41 System developers including
    - Textron, General Dynamics, Honeywell, Northrup-Grumman, BAE, Boeing and Lockheed-Martin
  - 6 Training organizations including
    - Battle Command Training Center, Digital Warrior School, National Simulation Center
  - 1 pending Foreign Military Sale
    - Australian Defense Force
  - 11 Miscellaneous including
    - US Army SigCen Frequency Proponency Office, DISA/TEMC