



ARMY GEOSPATIAL CENTER

ENABLING GEOSPATIAL INFORMATION DOMINANCE



Advancing Geospatial Interoperability
Esri International User Conference, Defense Intelligence Executive Track

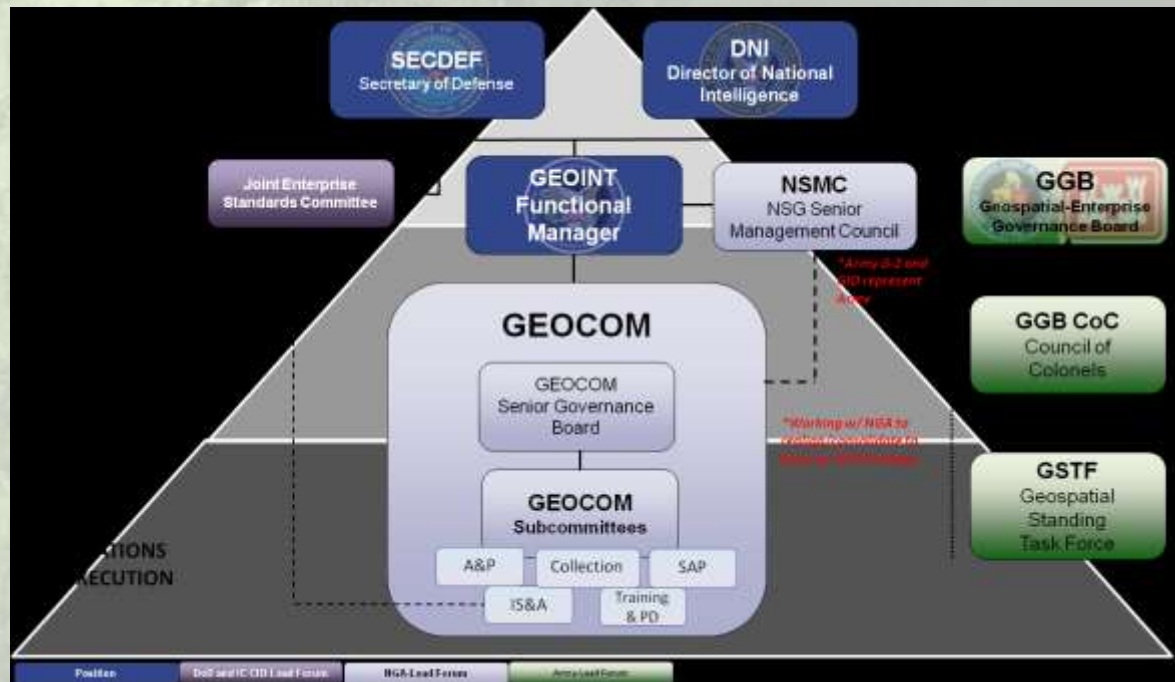
Presented by:
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E: daniel.l.visone@usace.army.mil
21JUL2015



US Army Corps of Engineers
BUILDING STRONG.



Recent Tasking from the Army Geospatial-Enterprise Governance Board



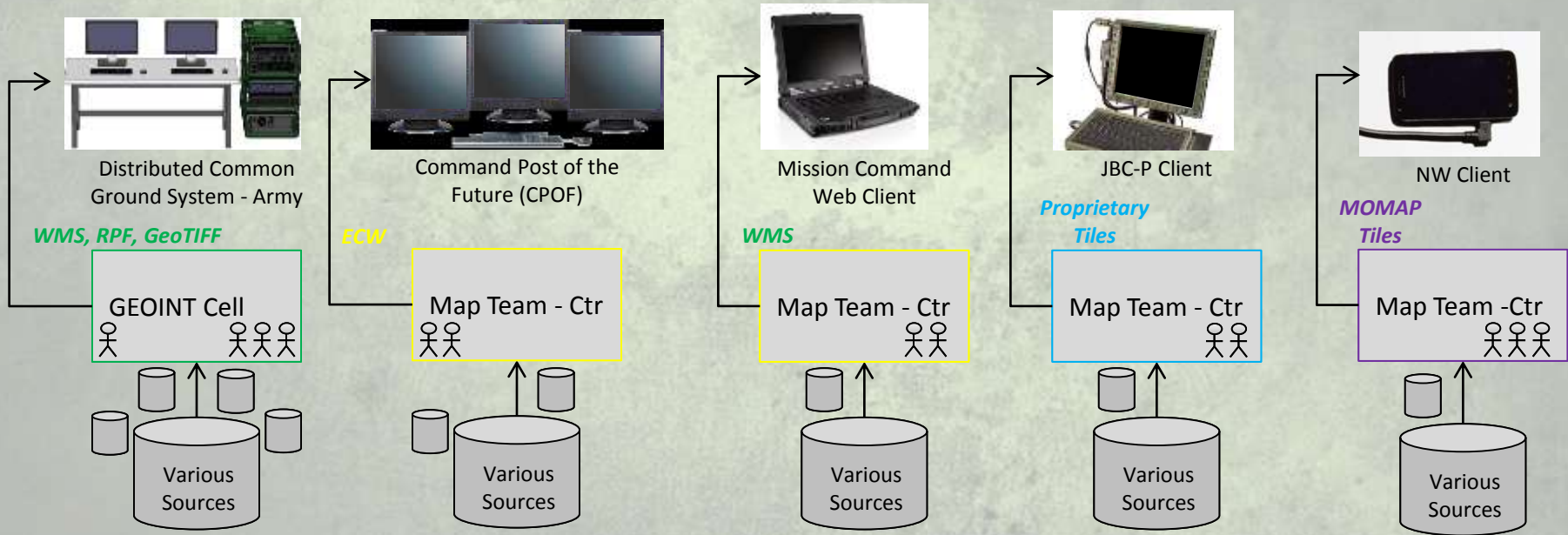
1. Review of all Program of Record (POR) and Acquisition Program Candidate (APC) systems and an analysis of the geospatial compatibility of each.
2. Address issue of a content managed foundation for the Army Geospatial Enterprise.
3. Address a process for the certification of Army systems to ensure geospatial interoperability.
4. Discuss the capabilities of the AGE Node and how it can support Geospatial Interoperability and System Certification

GGB Also Wanted To Know How We Got Here And How We Are Addressing





Army Issue: Lack of a Standard & Shareable Geospatial Foundation (SSGF)

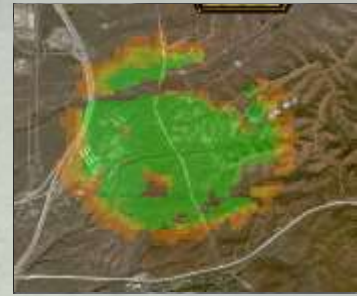
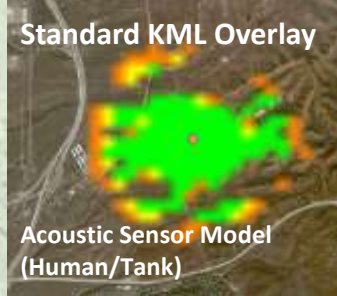


Too many different geospatial formats between Systems and too many geospatial preparation teams performing content management





Army Issue: Lack of a Common Overlay standard displayed on SSGF



Distributed Common Ground System - Army



Command Post of the Future (CPOF)



Mission Command Web Client



JBC-P Client



NW Client

Too many interpretations of Standards:

- Why – Standards, and Implementation of the Standards, Open to Interpretation
- Solution
 - Adoption of Open Standards
 - National System for Geospatial Intelligence (NSG)/Allied System for Geospatial Intelligence (ASG) Profiles for Those Standards
 - Open Geospatial Consortium Profiles for Those Standards

Too many different interpretations/implementations of KML 2.2





Army Issue: Inconsistent implementation of SSGF Standards



Distributed Common Ground System - Army



Command Post of the Future (CPOF)



GCCS-A



TIGR



NW Client

- WMS is not supported by Joint Capabilities Release (JCR), Joint Battle Command-Platform (JBC-P), and NettWarrior, therefore could not be displayed
- WMS Service connects for each application, looks correct, BUT.....

Native WMS support still missing from many Program Of Records

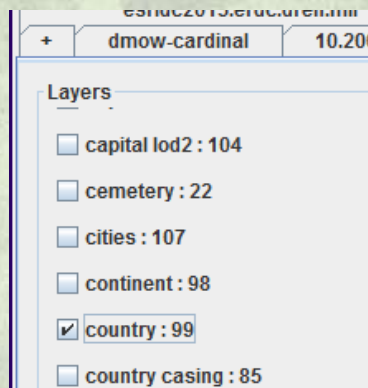




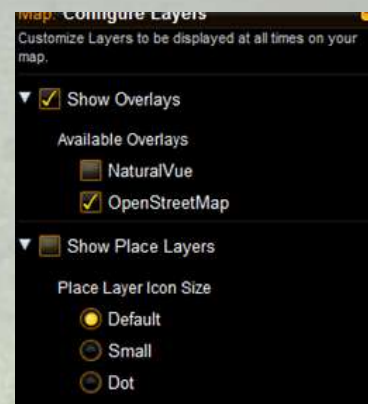
Army Issue: Inconsistent implementation of SSGF Standards



- WMS Services with only a small image are not handled properly as transparency isn't used for the rest of the tile



- Only a single layer may be used out of each WMS connection.
- Only one WMS connection displayed at a time



- Only one WMS connection can be used at a time.
- All local maps loaded into TIGR are turned off in order to use WMS



Command Post of the Future



TIGR

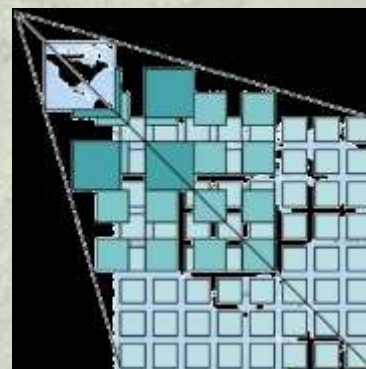
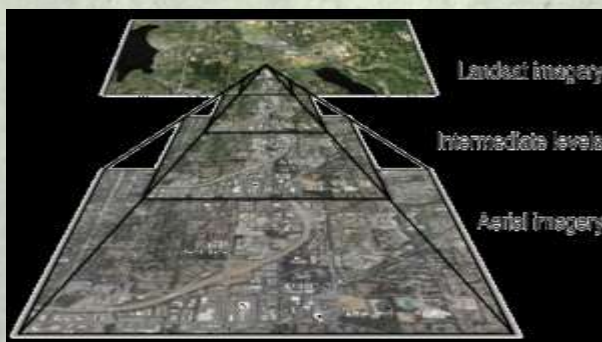
WMS Implementation Varies Between POR's





Army Issue: Moving Geospatial Data to Disconnected, Intermittent, and Low-Bandwidth (DIL) Environment

- Dozens of DOD/Army mobile/HH device applications requiring unique map data
 - Expensive to develop and maintain duplicate, proprietary map stores for each application
- Lack of Network Bandwidth at tactical level to stream SSGF basemap and image data
- Continuously streaming maps over tactical networks rapidly drains the battery
- Storage on mobile/HH devices is limited
 - Typical AOI will be thousand of square KMs of map/imagery coverage with additional high res image insets.



No standard (prior to Geopackage) addressed distribution and direct-use of SSGF on mobile/handheld (M/HH) devices.



Initial Assessments of Army Program Geospatial Interoperability



Number	System Name	Current Levels of Compatibility								Initial PM Assessment		Initial SASD Assessment		CCCs – Stds Profiles		Risk to Implementation due to transition to Sustainment	GFMSA / AIC / AGE Certification (MVA-13)	AIC / AGE Certification (MVA)	
		ADS	SSGF Data Formats	SSGF Web Services	Loading SSGF	Data Management	SSGF Updates	Data Model	Geospatial Analytics	Common User Interface	Datums, Projections, Coordinate Systems	GD&I Exchange	Roll-up	Gap Identified	COE Version for CCC-S				COE Version for CCC-C
1	AFATDS	1	0	0	1	0	1	0		1	0	0			3	3			
2	AMDPCS	1	1	0	1	0	1	0		1	0	1			3	3			
3	AMPS	1	1	1	1	0	1	0		1	0	1			3	3			
4	C2I VM										0					3			
5	CPOF	3	0	3	1	0	2	0		3	0	1			3	3			
6	DCGS–Army	3	1	3	3	1	3	1		3	1	2			3	3			
7	DDS (Network Server)																		
8	GCCS-A	2	0	3	1	0	1	0		1	0	1			3				
9	JBC-P NOC / NSG	1	0	3	1	0	1	0		1	0	1			4	3			
	JBC-P Vehicle	1	0	1	1	0	1	0		1	0	1			4				
	JBC-P TOC Kit	1	0	2	1	0	1	0		1	0	1			3				
10	S2MC - formerly BCS3	1	0	3	1	0	0	0		1	0	1			3				
11	TAIS	1	1	3	1	0	1	0		3	0	1			3	3			
12	WIN-T	1	1	1	1	0	1	0		1	0	1			4				
13	Nett Warrior	2	0	0	1	0	0	0		0	0	0			3	4			
14	TIGR	3	1	3	1	1	1	1		1	0	1			3				

RED = NONE
 ORANGE = BASIC
 YELLOW = INTERMEDIATE
 GREEN = ADVANCED

Initial Assessments indicate no Army SSGF content manager, inability to share SSGF content, and reliance on FSRs to load SSGF content



How We Got Here

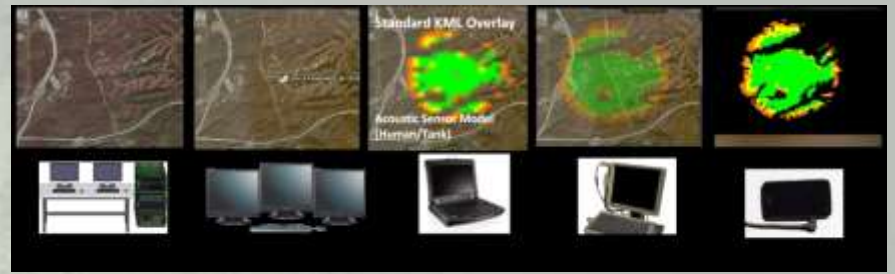


• Doctrine/Guidance

- No specific regulatory guidance
- Need for an Overarching Army GEOINT CONOP

• Requirements

- DCGS-A requirement to provide geospatial foundation is relatively new (Increment 1 Capability Production Document 2012)
- Mission Command System requirement to pull SSGF from DCGS-A is non-existent and inconsistent geospatial requirements across the Army



• Standards

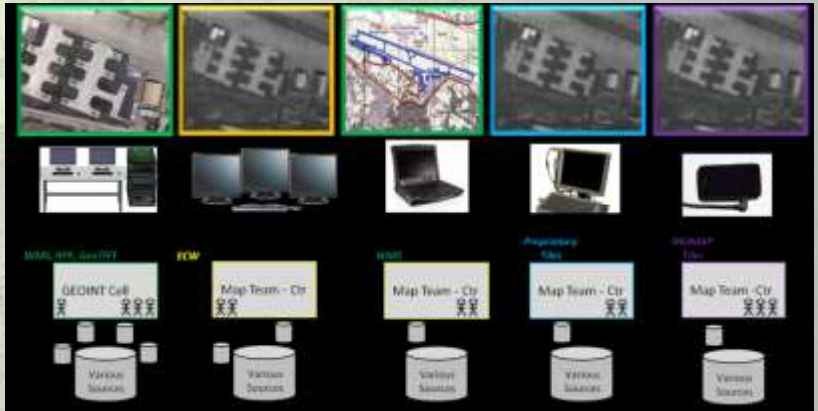
- Gaps of Open Standards for GEOINT
- Adoption and implementation of Open Standards evolving
- Lack of Profiles and Implementation Guidance

• Testing

- No robust geospatial test threads and interoperability testing
- No specific requirement for AGE certification

• Training

- Lack of Geospatial for PMs, PORs, Acquisition Professionals



No Requirement For a System of Systems Approach to Ensure Geospatial Foundation Interoperability until Common Operating Environment



How We Are Addressing

• Doctrine/Guidance

- AR 115-11, GI&S, October 2014
- Developing GEOINT CONOPs (INSCOM, G2, AGC)

• Requirements

- DCGS-A Increment 2 Information System (IS) Capability Development Document (CDD) – Draft
- Net enabled Mission Command (NeMC) Initial Capabilities Document (ICD) - December 2011
- Common Operating Environment (COE) IS CDD – Draft

• Standards

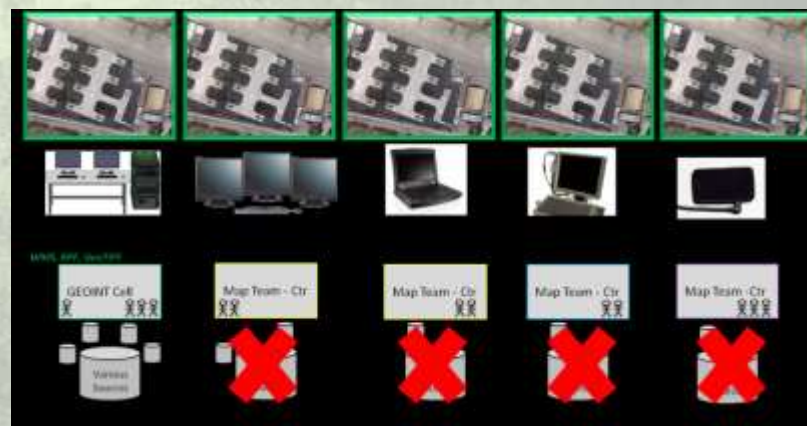
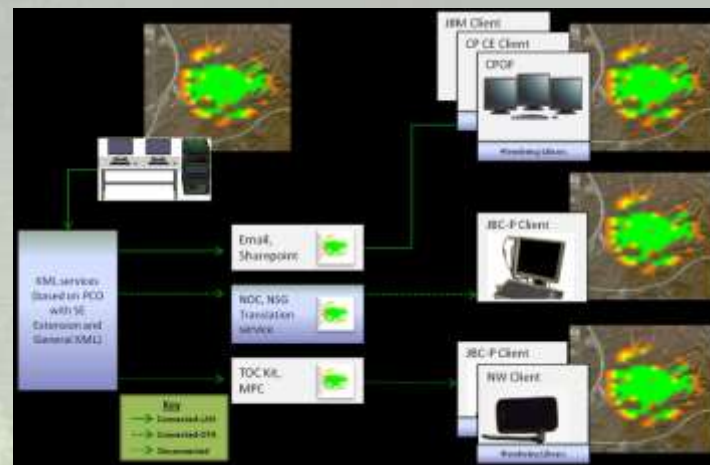
- Open Geospatial Consortium (OGC) GeoPackage approved in 2014
- Developing an NSG Profile for OGC GeoPackage
- Developing KML Application Profile and Recommended Practices for Army/NSG/ASG/OGC
- Evaluating NSG Profiles for OGC web services (WMS, ...)

• Testing

- AR 115-11, GI&S, October 2014
- Updated Army Interoperability Certification (AIC) test threads related to foundation GEOINT
- NSGD 8103, GEOINT Standards Conformance – Draft

• Training

- Engaging with Computing Environments and Key PMs



COE is codifying Consistent Geospatial Requirements Through a System of Systems Approach to Enable Geospatial Interoperability





Addressing the SSGF – Standards Issue

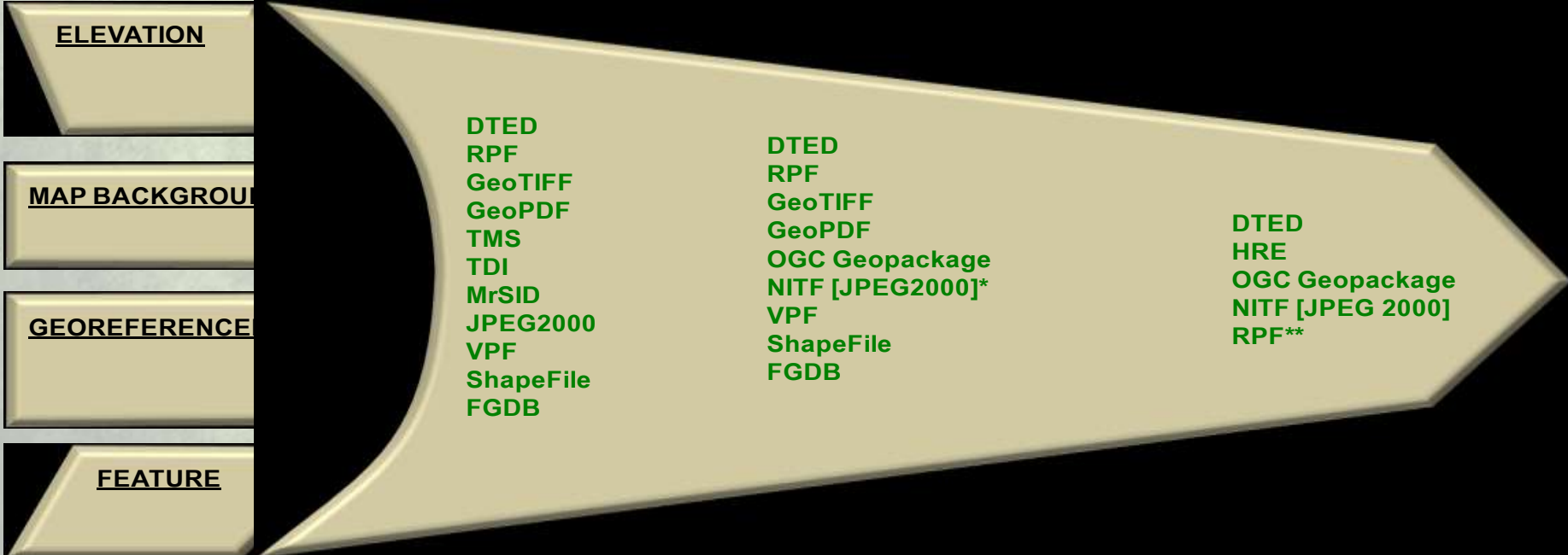


Data Formats Migration

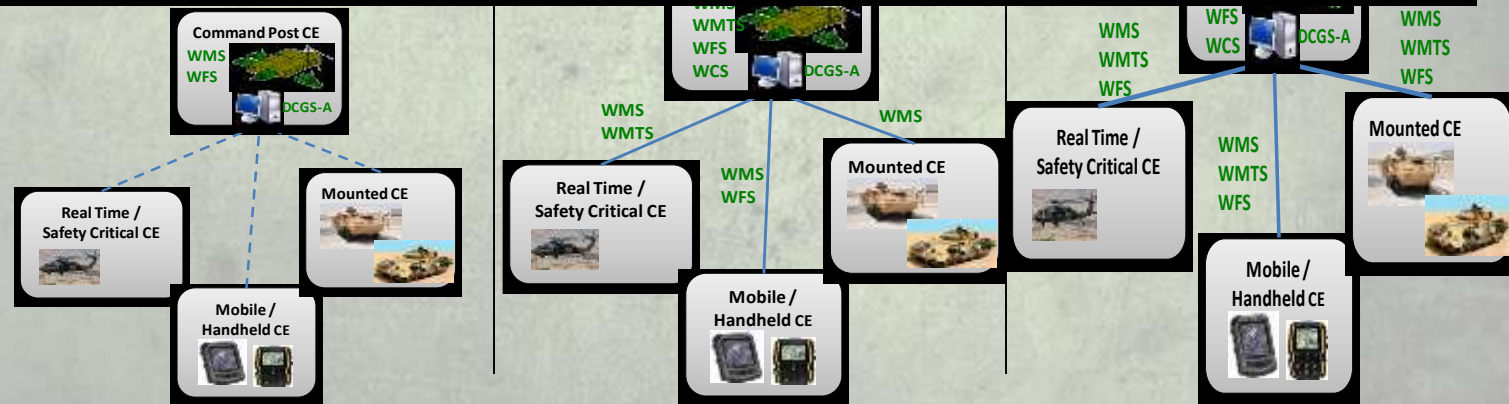
COE v2.0

COE v3.0

COE v4.0



Web Services Migration

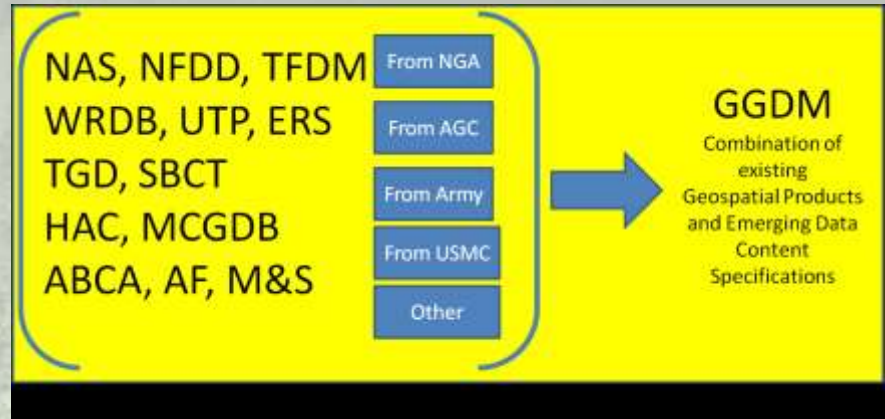




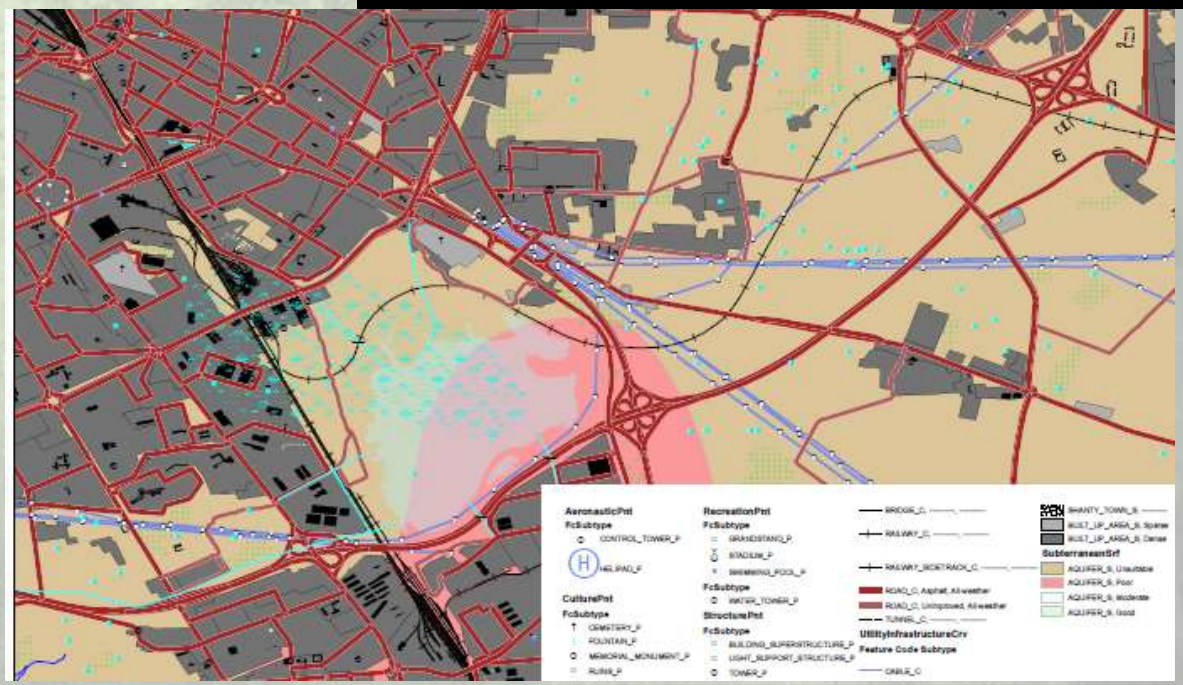
Ground-Warfighter Geospatial Data Model



The Ground-Warfighter Geospatial Data Model (GGDM) provides a mechanism to consistently depict and use “common” Geospatial Data across Army Programs, Marine Corps systems, and Allies to ensure interoperability.



- GGDM 2.1 → NAS 4.0 (Nov 2012)
- GGDM 2.2 → NAS 6.0 (Dec 2014)
- GGDM 3.0 → NAS 7.0 (Jan 2016)





Leveraging the AGE Node to Address Army Geospatial Issues



Provides simulated COE:

- **Data Center (DC) Computing Environment (CE)**
- **Command Post (CP) CE** (e.g. DCGS-A, CPOF, GCCS-A)
- **Mounted (M) CE** (e.g. JCR, JBC-P, TIGR)
- **Mobile Handheld (M/HH) CE** (e.g. NettWarrior)
- **Sensor (S) CE** (e.g. Integrated Sensor Architecture (ISA))



8 Army Acquisition Systems
14 research projects
3 reference implementations
201 Virtual Machines (VMs)

Provides environment to:

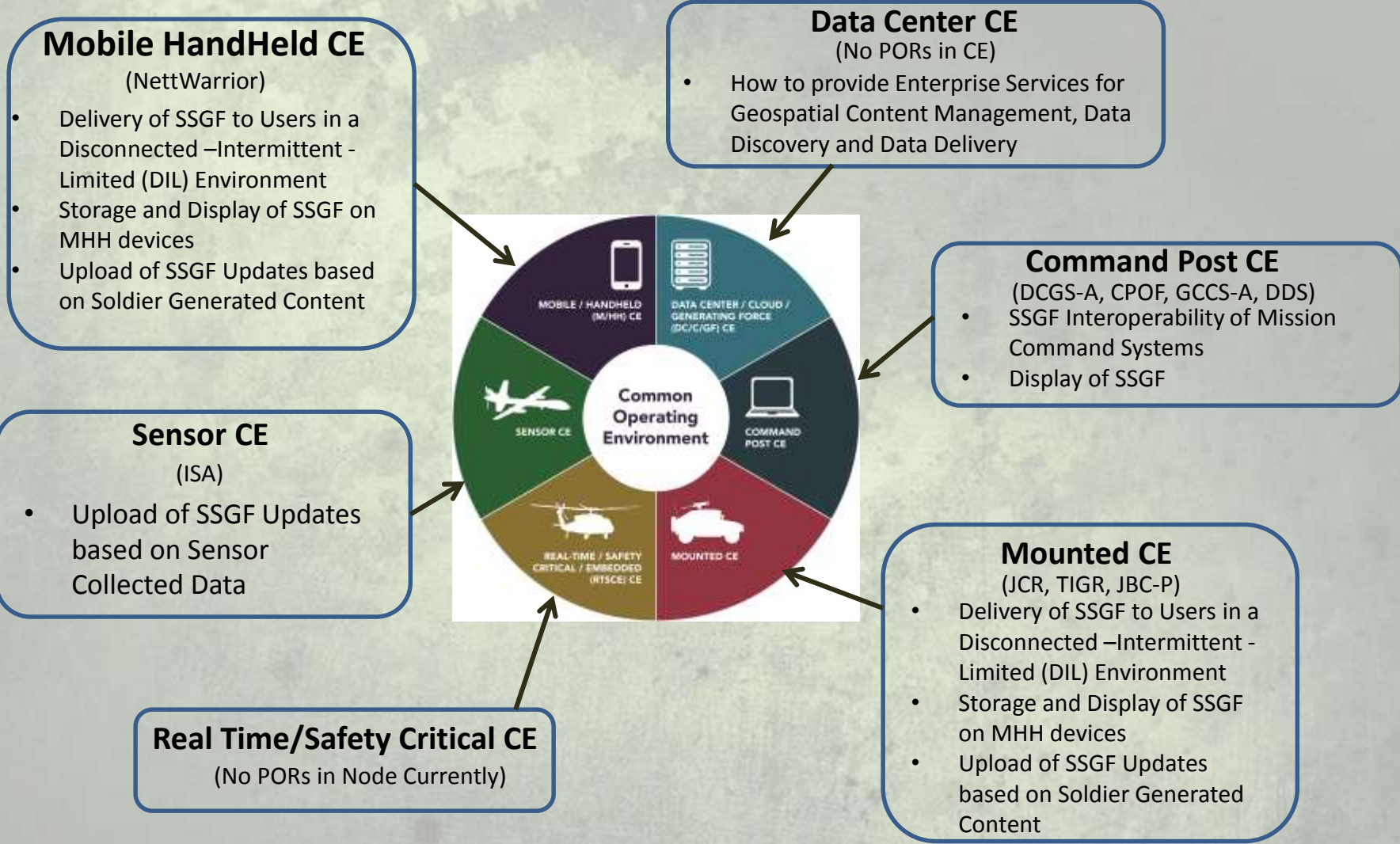
- Evaluate/validate proposed geospatial architectures, current and emerging standards /standards implementations, and proposed Tactics, Techniques and Procedures (TTPs) as well as conduct technology assessments in support of the AGE and COE
- Experiment, integrate and engineer Research and Development (R&D) efforts to ensure interoperability within the COE, thus providing risk-mitigation for technology transfer
- Collaborate with industry and academia to enhance GIS technology
- Support Geospatial System Interoperability Assessment and Certification

Simulates the fielded systems in a lab environment to enable the AGE





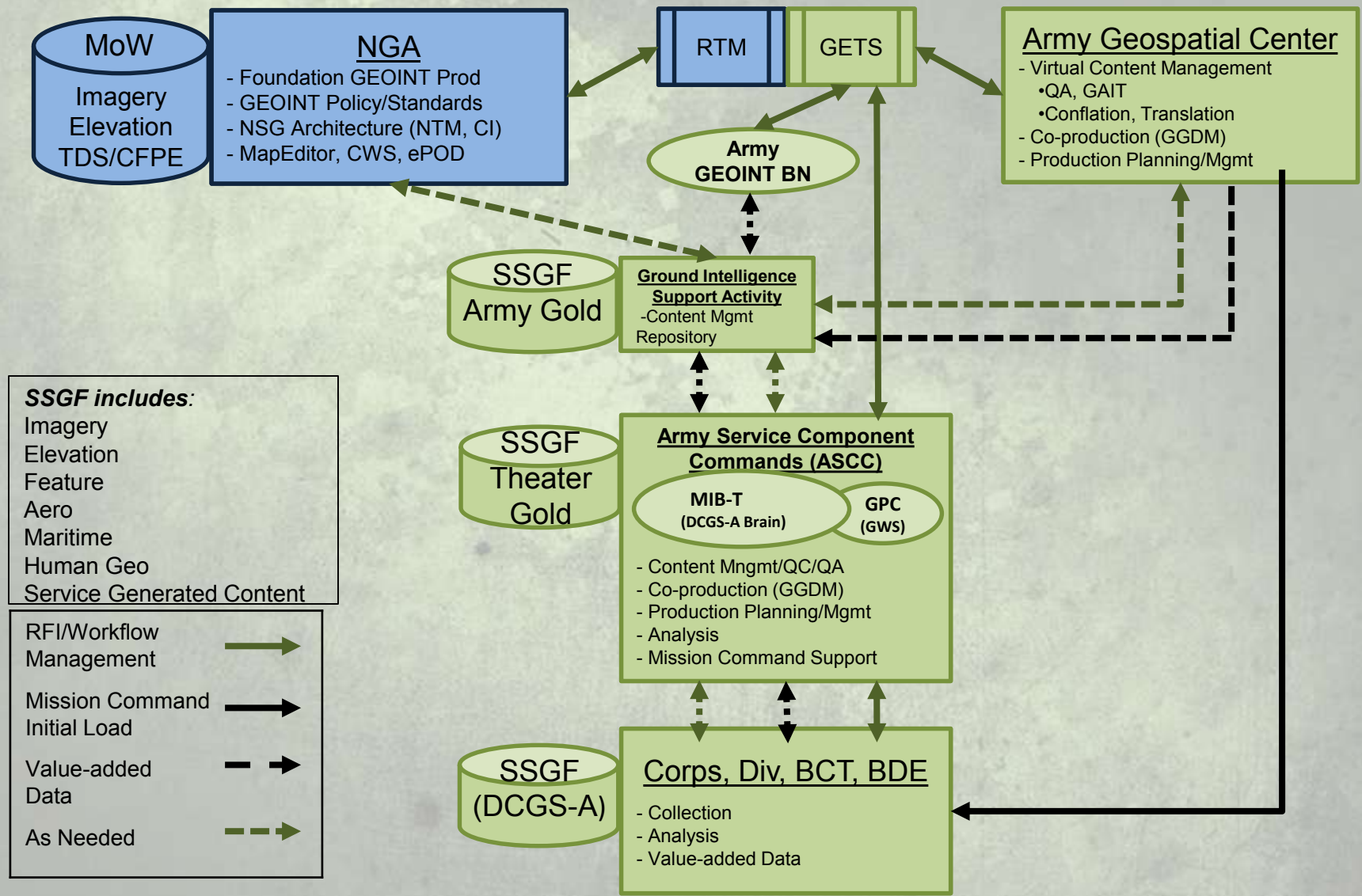
AGE Node support to enable the SSGF across the Computing Environments (CEs)



Providing feedback and recommendations to CEs on implementing geospatial component of COE

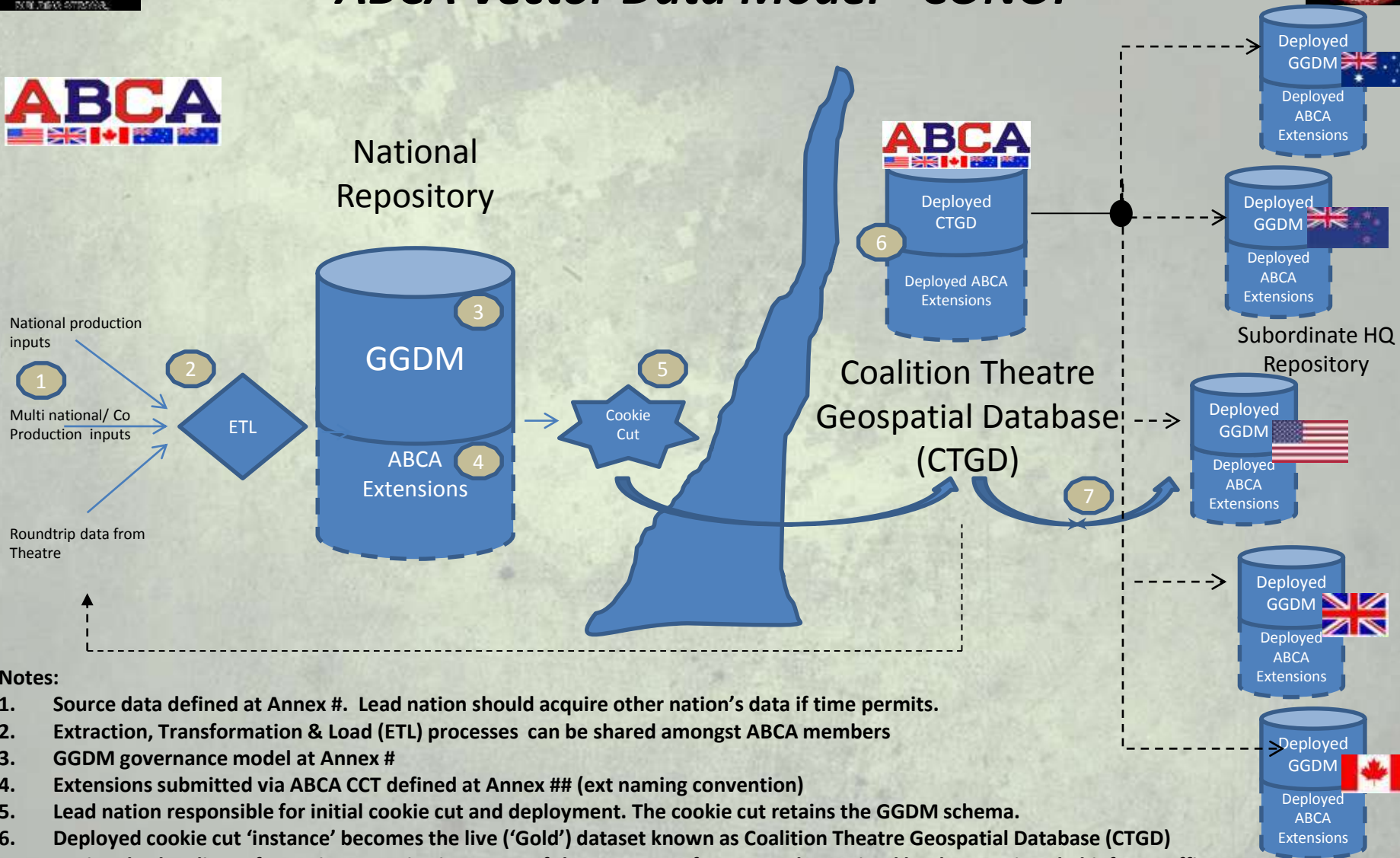


SSGF Content Management (Notional)





Addressing Federated Geospatial Data Production ABCA Vector Data Model - CONOP



Notes:

1. Source data defined at Annex #. Lead nation should acquire other nation's data if time permits.
2. Extraction, Transformation & Load (ETL) processes can be shared amongst ABCA members
3. GGDM governance model at Annex #
4. Extensions submitted via ABCA CCT defined at Annex ## (ext naming convention)
5. Lead nation responsible for initial cookie cut and deployment. The cookie cut retains the GGDM schema.
6. Deployed cookie cut 'instance' becomes the live ('Gold') dataset known as Coalition Theatre Geospatial Database (CTGD)
7. National subordinate formations receive instances of the CTGD on a frequency determined by the appointed Chief Geo Officer.
8. Formation CWAN users and National subordinate formations consume services





WAY AHEAD



- Develop National-to-tactical GEOINT enterprise CONOP
 - Address all DOTMLPF aspects of Army GEOINT
- Implement Geospatial Component of the Common Operating Environment
 - Ensure Cross Cutting Capabilities (CCC) are included in POM 17-21 Build
 - Ensure Geospatial Key System Attributes (KSAs) are included in Common Operating Environment and Computing Environment Information System Capabilities Development Documents/Requirements Definition Package
- Implement AGE Certification as a criteria for completion of COE-phased testing
 - GEOINT Functional Manager Standards Assessment (GFMSA) alignment
- Leverage AGE Node and align efforts with NSG Partners (NGA, USMC, ...)

Geospatial is a cross-cutting capability, essential to Army mission command, that needs to be addressed in Requirements, Resourcing, and Acquisition.





QUESTIONS?

Title: Advancing the Army Geospatial Enterprise (AGE)
through the AGE Node

Date: Wednesday, 22 July at 1330

Location: Omni Ballroom C

