

Unclassified/FOUO

# One Semi-Automated Forces (OneSAF) and Enterprise Data Services (EDS) Industry Day



Vidal Acevedo, APM

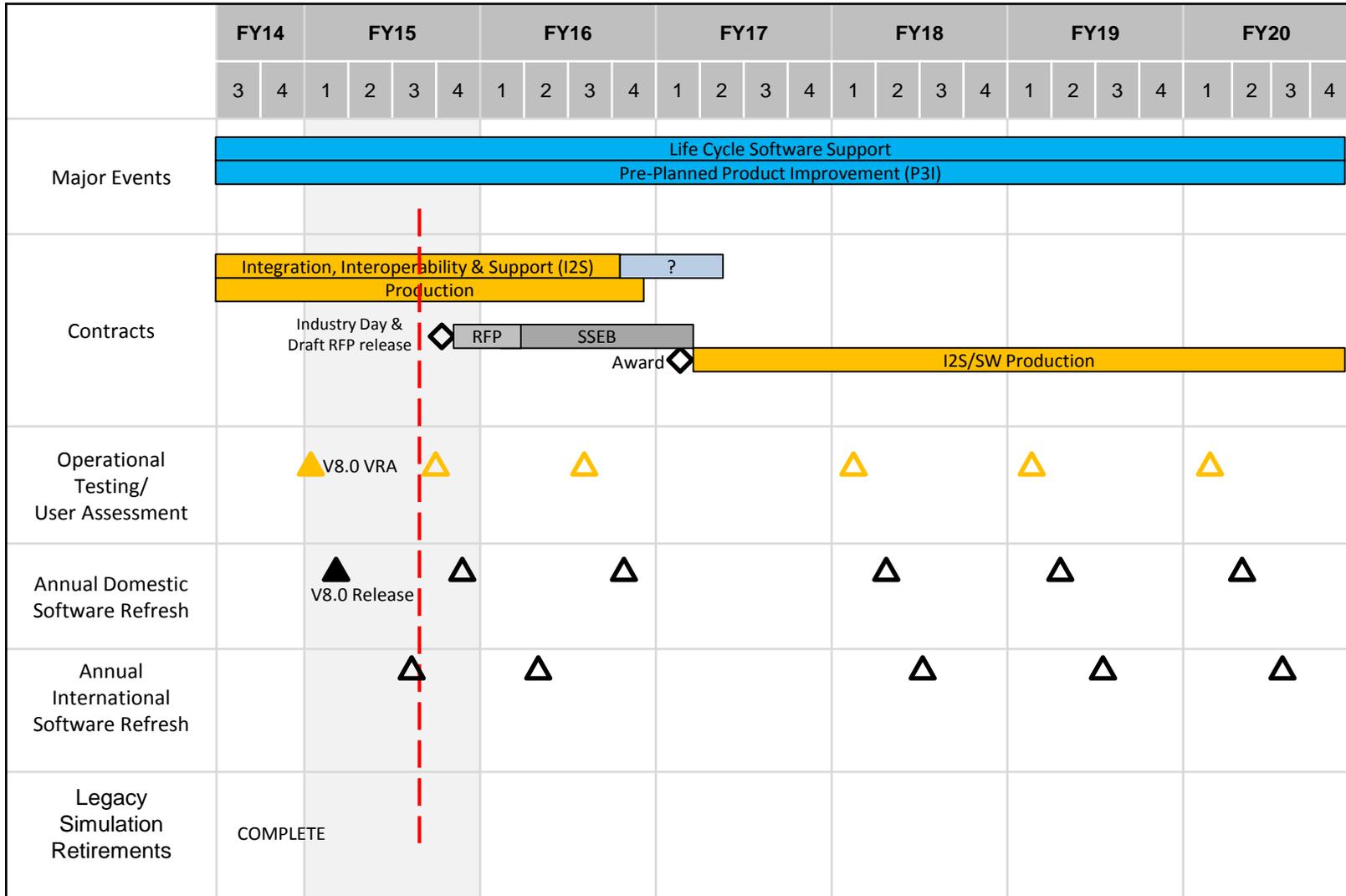
Bruce Robbins, Lead Engineer

Ralph O'Connell, Systems Engineer

29 May 2015



# Unclassified/FOUO Program Summary





# Unclassified/FOUO What is OneSAF



## Objectives:

- The US Army's composable, entity based simulation system designed for brigade and below, combat and non-combat operations.
- Reduce Army Life Cycle M&S costs
- Capable of replacing US Army legacy entity based simulations

Experimentation

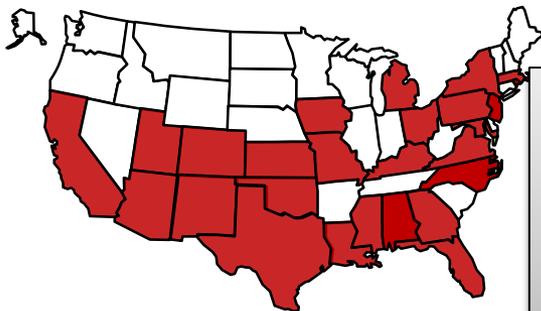
T&E

Intelligence

Acquisition

Training

Analysis



Over 200 Hundred Domestic Locations & 7 International Partners

## Users:

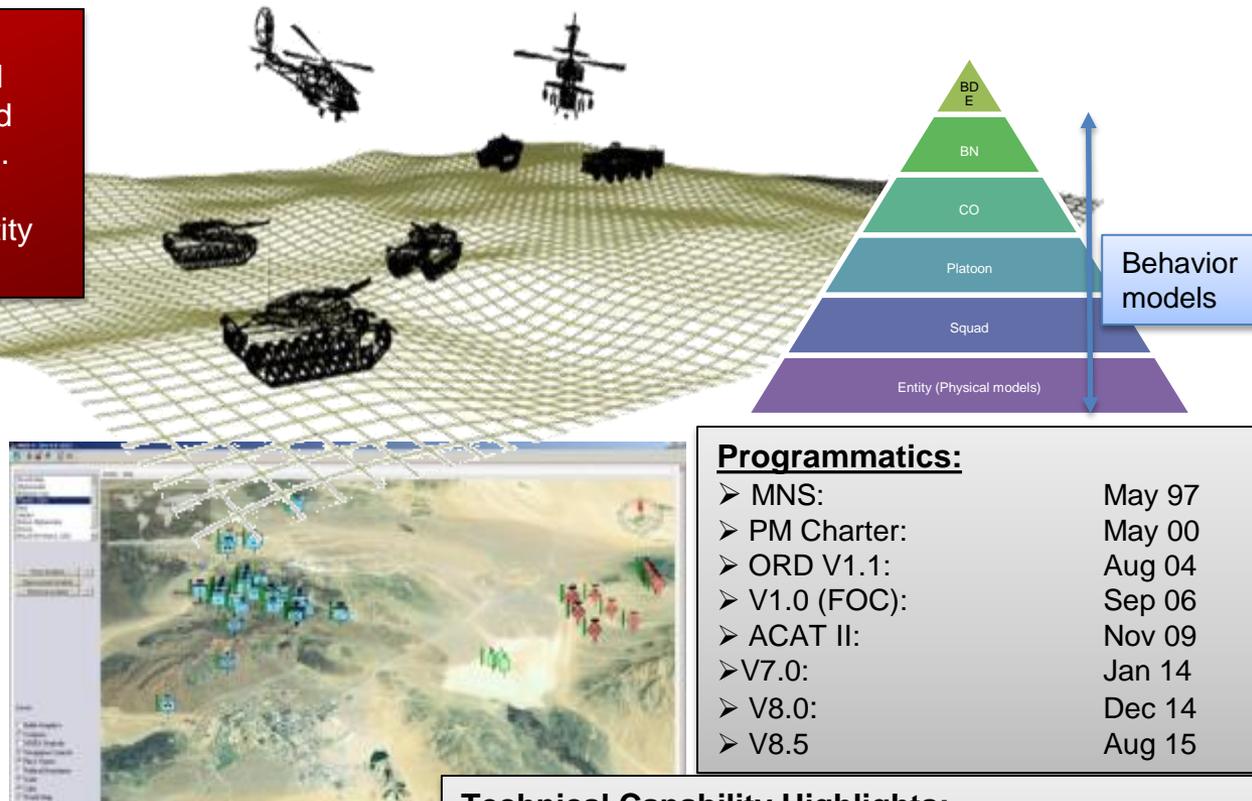
- RDECs / Battle Labs / Active Duty Brigades & Battalions
- Service / Joint Organizations
- International Partners
- USG Contractors / Academia

## Technical Capability Highlights:

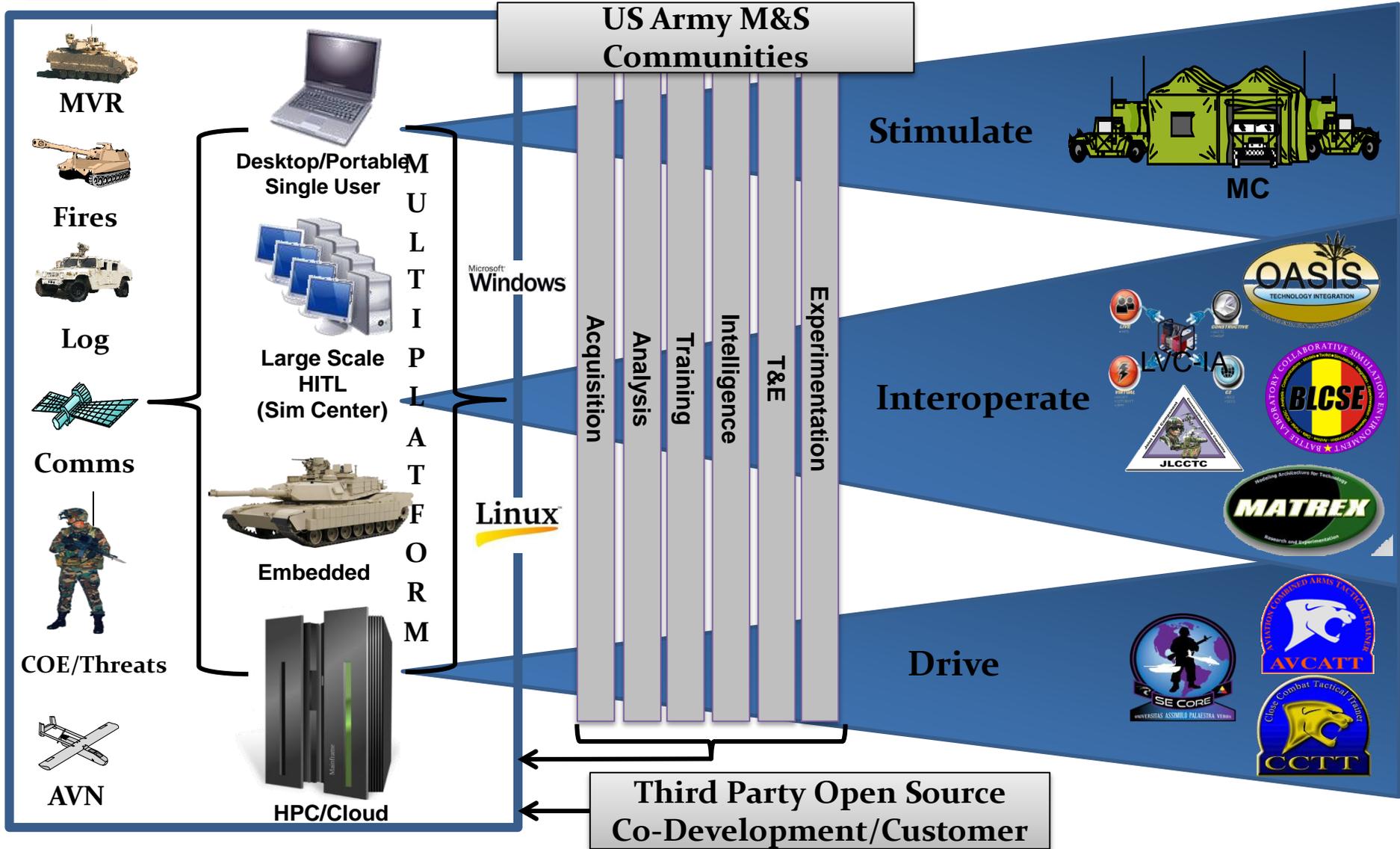
- Provides CGF/SAF entity modeling to BDE level
- Supports Live, Constructive & Virtual Domains
- Provides Urban Operation modeling with COE Focus
- Provides Scenario Generation thru AAR Operations
- Provides DIS/HLA/JC3IEDM/ABCS Interoperability
- Supports all M&S community applications
- Platform independent (Linux/Windows) software

## Programmatics:

- MNS: May 97
- PM Charter: May 00
- ORD V1.1: Aug 04
- V1.0 (FOC): Sep 06
- ACAT II: Nov 09
- V7.0: Jan 14
- V8.0: Dec 14
- V8.5: Aug 15



# Unclassified/FOUO OneSAF's Complex Mission





# Unclassified/FOUO Army M&S OneSAF Communities



## Experimentation

- ▶ Army Concept Development
  - ▶ Army Transformation
  - ▶ O&O Development
  - ▶ Doctrine Development
  - ▶ Supports AoA
- ▶ OneSAF Representative: LTC Barry, JAMSD, ARCIC

## Analysis

- ▶ System Analysis/Design
  - ▶ Component Analysis/Design
  - ▶ Reliability Analysis
  - ▶ Life Cycle Cost
  - ▶ Logistics Analysis
  - ▶ Performance Factors
- Facilitates Experiments of Future System Capabilities  
Supports the overall DOTMLPF Process  
Enables Analysis of new Tactics, Techniques and Procedures
- ▶ OneSAF Representative: Mr. Thomas, AMSAA

## Training

- ▶ Collective training
  - ▶ Individual training
  - ▶ Embedded training
  - ▶ Mission rehearsal
  - ▶ Staff training
  - ▶ Crew Training
  - ▶ Distributed Training
- Provide synthetic forces in virtual sims  
Stimulate C2 systems for battle training
- ▶ OneSAF Representative: LTC Olson, NSC

## Test & Evaluation

- ▶ System Analysis/Design
  - ▶ Component Analysis/Design
  - ▶ Reliability Analysis
  - ▶ Life Cycle Cost
  - ▶ Logistics Analysis
  - ▶ Performance Analysis
- Provides wrap around force representation for ATEC and NIE events
- ▶ OneSAF Representative: Mrs Thomas, OTC

## Intelligence

- ▶ Describe/Deliver the Operational Environment (OE)
  - ▶ Verify/Assess the OE (V&V)
  - ▶ OPFOR / Threat Doctrine Development
  - ▶ Test & Support
- ▶ OneSAF Representative: Mel Cape, TRADOC G2

## Acquisition

- ▶ Collective training
  - ▶ Individual training
  - ▶ Analysis of Alternative
  - ▶ Reliability Analysis
  - ▶ Interoperable
  - ▶ Milestone A/B Decisions
  - ▶ Life Cycle Cost
- ▶ OneSAF Representative: Chris Metevier, ARL





# OneSAF Modernization Path



- Product Line Arch Framework
- Requirements from Analysis, Research, and Training Domains
- Thick client Java UI
- Large footprint for dist use
- 1st gen common components

Past



- Gateway-based interop (HLA/DIS)
- Distinct M&S-MC environments
- MSDL/C-BML Adoption

Present (2013-2015)



- Adoption of web services & technologies
- Centralized Distributed Sim Capability
- Loose coupling of common components
- Early integration within COE arch
- Preliminary virtualization & cloud computing prototyping

Future (>2015)



- Re-use of COE CPCE common core
- Thin client delivery via simulation apps/widgets (Ozone Widget Framework)
- Cloud-based simulation-as-a-service capability (anytime, anyplace, on-demand)
- Embedded simulation for Mission Rehearsal, Planning, and COA analysis

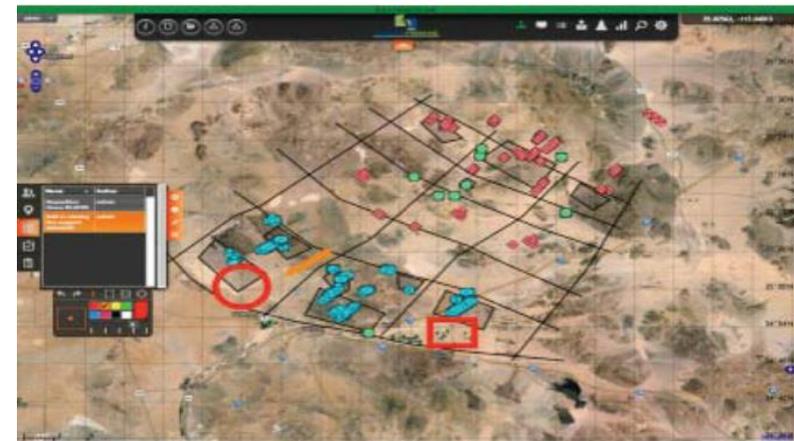




# Folding in Next Generation Capabilities



- **User Data Gateway (UDG):**
  - Web access to the OneSAF data model
  - Basis for remote access to web tools
- **Web Control Tool (WCT):**
  - Browser-based interface to control OneSAF units/entities
  - Eliminates need for operator nodes to have OneSAF baseline installed (Firefox browser only requirement)
  - Decouples OneSAF's front-end to its back-end
- **Web Military Scenario Definition Environment (WebMSDE):**
  - Browser-based interface to laydown simulated units/entities and their associated tasks, graphics, etc
  - Completely standalone or loosely coupled to OneSAF UDG
  - Collaborative multi-user scenario editing with import and export into MSDL/OBS
- **Web After Action Review (WebAAR):**
  - Record, analyze, and generate take-home package for OneSAF simulation runs
- **Unit Level Entity (ULE):**
  - Provide aggregation capability to achieve higher entity count
  - Increases operator span of control while decreasing computational requirement



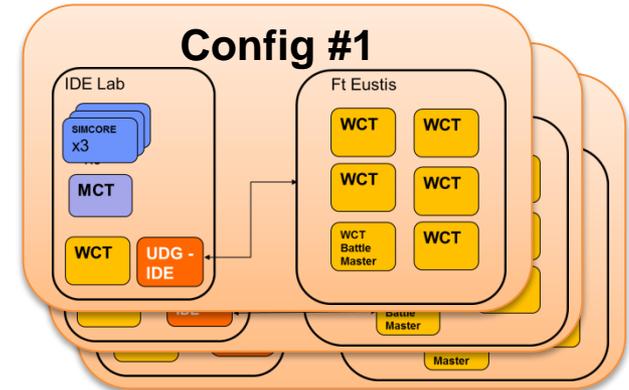


# Cloud and Virtualization Initiatives



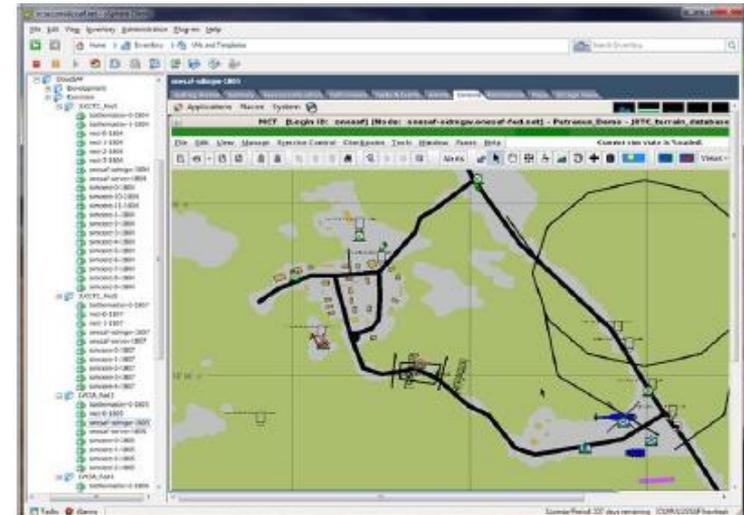
## • Cloud hosted OneSAF services are in early stages:

- Seen as effective means to realize centralized simulation distribution
- Zero client side configuration with greater reliance on DoD networks
- Significant cost avoidance/savings (optimizes IT resources)
- Ongoing distributed testing with BLCSE (Fort Leonard Wood, Fort Eustis, Fort Leavenworth, and PEO STRI)
- Partnering with CERDEC



## • Monitoring larger DoD Cloud Computing initiatives for standards-based solution :

- Implementation and execution a game changer for how current Army simulations are fielded
- Leverage early industry OneSAF cloud prototypes (dynamic provisioning, monitoring, scalability, etc)
- Common solution set with COE Data Center/Cloud Computing Environment and DISA





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# Enterprise Data Services (EDS)



– Today and the CY15 plan







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**Army M&S Strategy**



- **Signed out (July 2014) by the Secretary of the Army and Chief of Staff of the Army**
  - **Key statements that show need for EDS**
    - “Enterprise consists of...tools, data products...” (Page 4)
    - “M&S and associated data to be accredited” (Page 7)
    - “Enable accessibility, discoverability, and reuse...data” (Page 7)
    - “Facilitate enterprise-level shared identification...” (Page 7)
    - **“Promote the sharing of tools, data...across the Army” (Page 10)**
    - “Employ tools in the form of models, simulations, and data” (Page 10)
    - **“The Army must have credible M&S tools and data to support the full range of Army organizational missions” (Page 11)**
    - “M&S users, managers, and developers will have the ability...reuse...and data” (Page 12)
  - OneSAF, supporting all of the M&S community, **requires data**





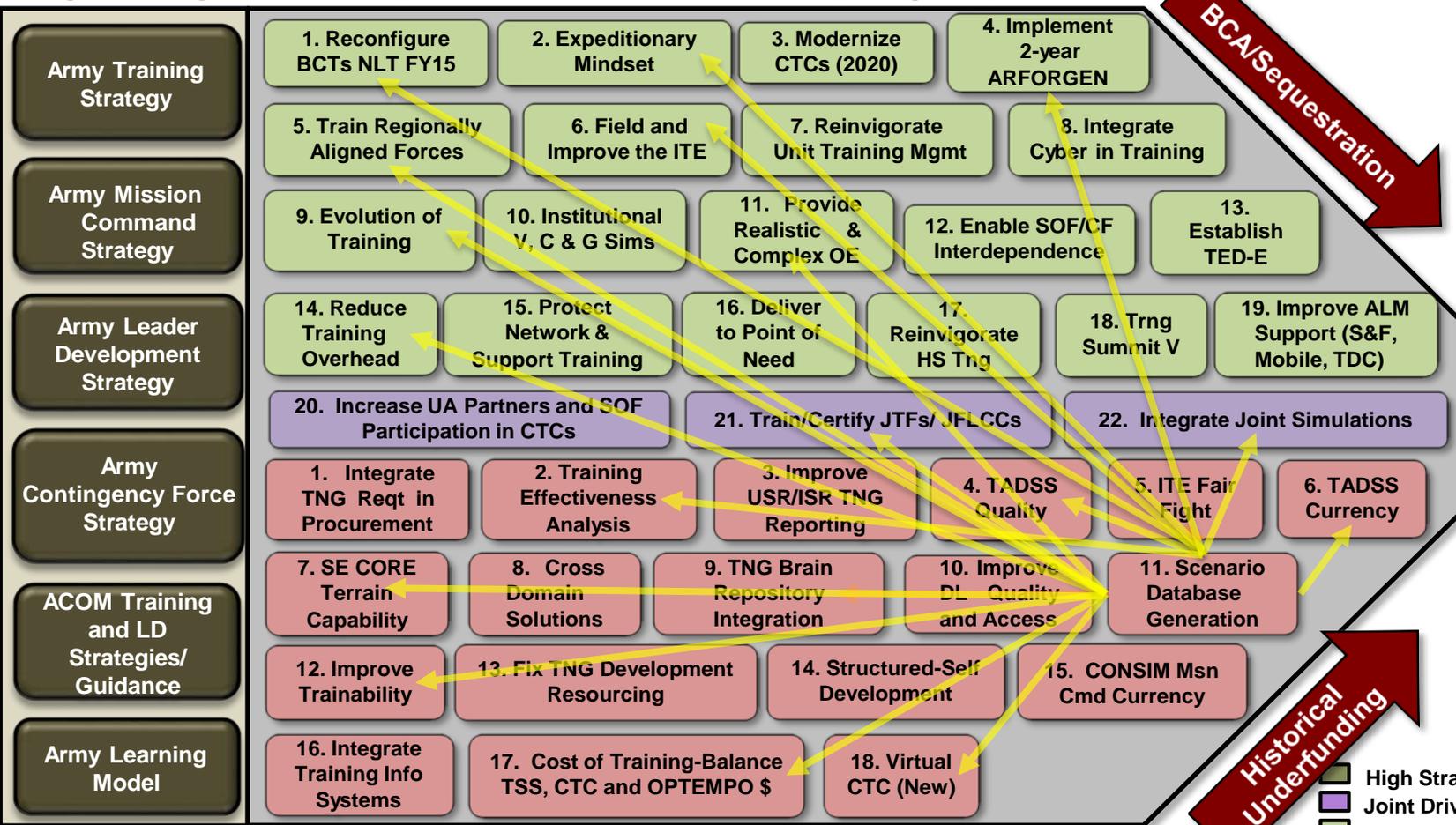
# EDS Impact on CAC-T

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The High Strategies (ATS, ALDS, AMCS), ACOM Training Guidance, the Army Learning Model, Proponent Strategies, other HQDA policies and guidance, identified wicked problems, and Joint capabilities all drive training requirements.

## High Strategies → Operational/Joint Drivers - Competing Requirements



BCA/Sequestration

Within a resource constrained environment, we must identify and deliver the most critical training, education, and leader development capabilities to best "train the way we fight" to develop agile and adaptive leaders and versatile units.

Historical Underfunding

- High Strategies Implementing
- Joint Drivers Guidance V.29
- Operational Drivers
- Wicked Problems

## High Strategies → Wicked Problems - Competing Requirements

It's about the Data and EDS is that Data Solution!





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# TCM ITE Advocacy



- TCM ITE advocates EDS as necessary for M&S communities of interest in support of Home Station, CTC's, and WFX Training with Joint Enablers
- There is currently no effective or efficient way for exercise developers to access and retrieve accurate, authoritative data needed to develop exercise databases.
  - This gap effects training relevancy, TADs system functionality, long lead time and cost to develop exercise databases, and lack of Training consistency across the Non-System Instrumented and Training Devises (NSITDs)
- TCM ITE recommends resources of EDS to:
  - Bring Authoritative and relevant Data Sets together through common data set standards so that today's and tomorrow's NSITDs reflect and keep current with the ever changing Complex Operational Environment (OE) in a cost effective and efficient manner





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# Cost Benefit Analysis



- M&S communities generally have established practices in place to obtain needed data
  - Training community seems to be embracing EDS
  - Some communities seem unsure as to utility at this point and may have under-reported potential benefits
  - Even if an organization may benefit, unless they want to use RDG they won't
  - Educational outreach may lead to a shift in current business practices
- Authoritative sources and governance are needed
  - Ensure providers create and refresh metacards for available datasets
  - Ensure datasets are credible
  - Define standards for data formats
- Potential for increased benefits over time
  - Additional participation from data providers (other Services expressing interest)
  - New users/existing users may discover additional benefits



# CBA Observations – Key EDS Capabilities



- Order of Battle
  - Benefit for organizations without access to military expertise
- Environment – Terrain and Weather
  - Terrain is a big and costly challenge
    - Re-using terrain databases can avoid development expense
    - Even locating existing terrain databases can be a time-intensive effort
  - Large number of Army models and simulations makes it difficult to support multiple terrain formats
    - Some organizations have unique simulations
  - Metacard catalog of terrain datasets may reduce duplication, facilitate collaboration, and provide visibility of available data
- Data Enhancement Services
  - Terrain translation tools are critical
    - Skepticism exists if viable tools are possible
  - OOB information is generally not “machine readable”
    - Emphasizes the importance of translation to standard formats





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**CBA Summary**



- Study shows EDS has the potential to benefit Army M&S communities – break-even point in FY24 and 25% ROI over study timeframe
- Translation tools / data enhancement services are critical to achieving the cost avoidance identified in this study
- Established practices can work for or against EDS – educating the community on potential benefits could increase use





# What We Are Trying to Accomplish



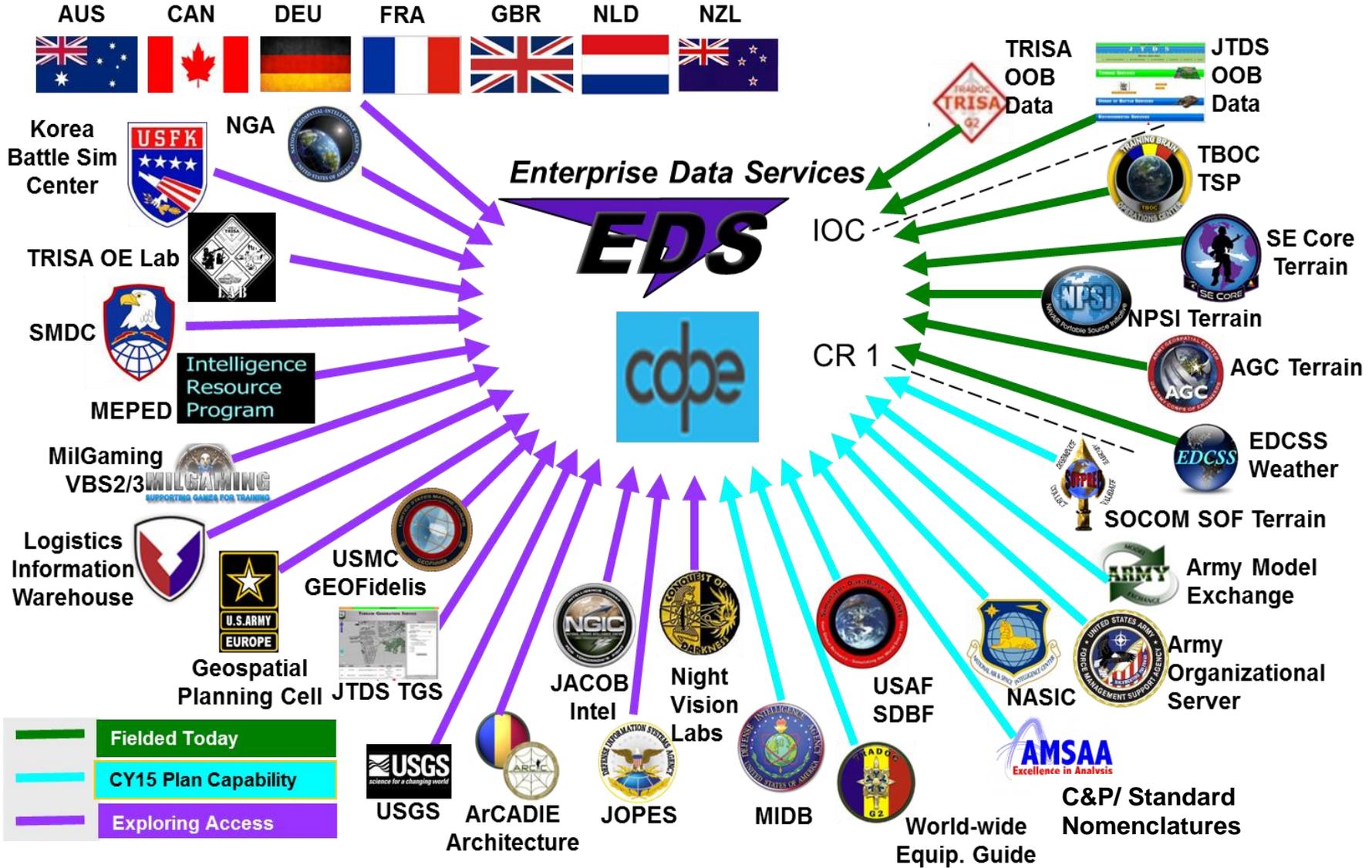
- Provide visibility into and access to US data sources via EDS to US coalition partners
- Make data from US coalition partners visible and accessible to both US and other coalition partners via EDS
- Venues for Collaboration
  - The Technical Cooperation Program (TTCP), Technical Panel 2, Action Area 19 - Shared M&S Resources and Technology for Training
  - NATO Modelling and Simulation Group 136 - M&S as a Service
- Influence data and process standards through international standards organizations





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# EDS Data Provider Integration





# Division of Responsibilities



## EDS Team

- Systems engineering lead
- Develops interfaces and metadata standards
- Provides a web-based user interface
- Harvests metadata from providers
- Passes distributed queries to providers
- Provides metadata cache
- Passes data requests with requestors credentials to providers



## Data Providers

- Works with EDS team to define appropriate metadata
- Creates, maintains, and stores metadata locally
- Provides services for harvesting and/or live search of metadata
- Sets metadata access policy
- Sets data access policy
- Provides data request service
- Provides data access services





# Management Strategy to Meet Needs



## EDS Oversight



CAA / AMSO



JS J6



AT&L / M&S CO

- Army Data Enhancement Tool Priorities

- JS Priorities
- JTEA Architecture Alignment

- Coalition data sharing priorities



Army DCS G-8

- Army M&S Strategy
- Army Cross-Community Priorities



NSC Army

- Requirements validator (proposed)



OUSD(P&R)

- P&R Data Policy (DoDI 1322.yy)
- DoD Cross-Service Training Priorities



- Stakeholder (producers and consumer) needs – interviews an workshops
- Requirements validation through use cases

ARCIC/ Battle Labs	TBOC	SOCOM	ATEC	SoSE&I	USAFMSA	SMDC	NAVAIR	AFAMS	TTCP TP2	NMSG 136
									AA19 (UK, NZ, AU, CA)	(UK, CA, GER, NED, FRA)
Virt. Targets Center	CAA	NSC/ TCM-C	TRISA	OneSAF SE Core LVCIA JLCCTC GFT	DIA	NWDC	DMOC	NASIC		
AMSAA Excellence in Analysis	AGC	STTC & NVESD	US ARMY RDECOM	NGIC	TECOM	AFWA	AF A9	DISA	JS J6/J7	





# Goals

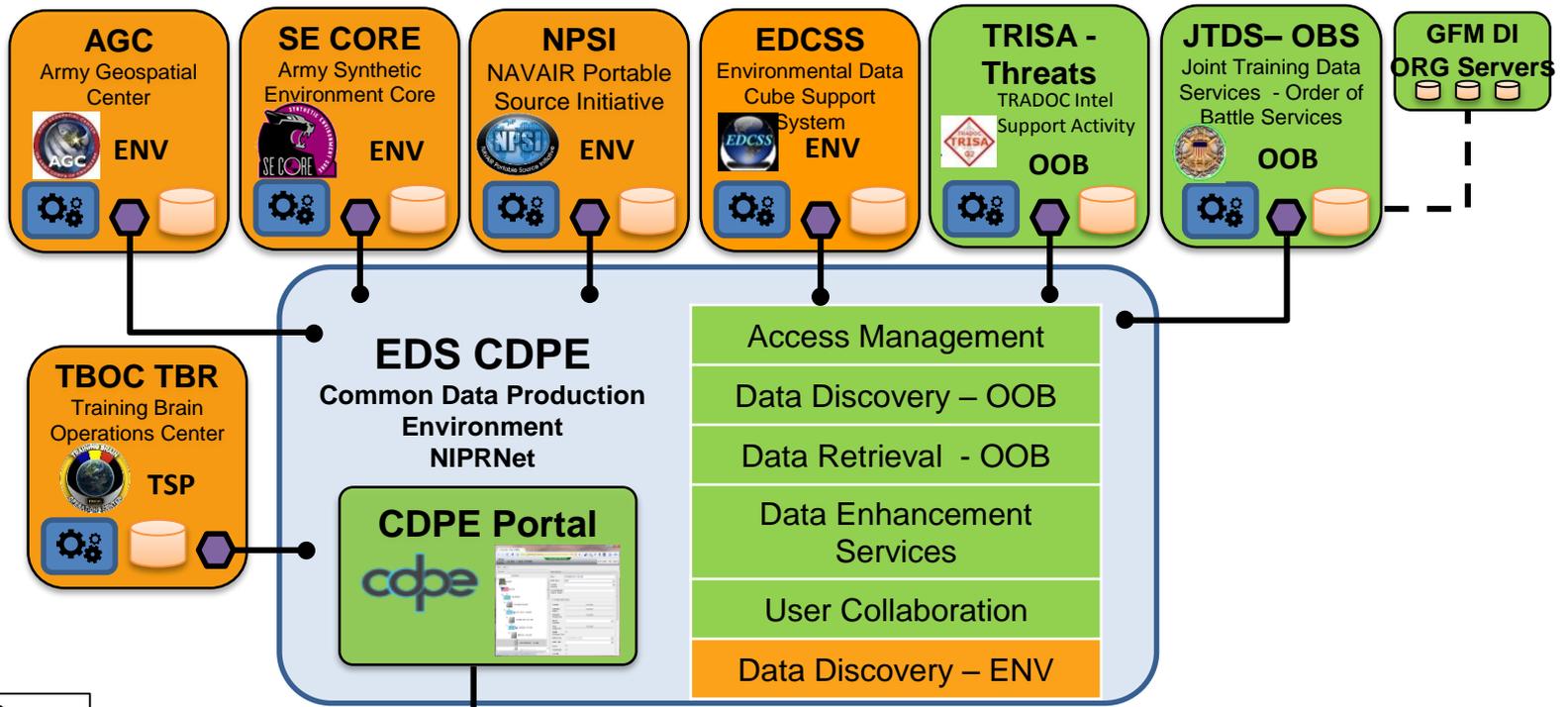


- Improve the speed and accuracy of informed decision making
- Increase interoperability and integration
- Achieve effective and efficient use of scarce departmental resources
- Leverage Department investments in data initiatives, services and frameworks
- Decrease gaps between initiatives





# EDS Common Data Production Environment (CDPE) - Today



**LEGEND**

- Green box: IOC NOV 13
- Orange box: CR 1 APR 15



**Reuse of Integrated and Correlated OOB and Environment Data and Weather Effects Generation**





# CY15 Build Plan (as of 12 May 2015)



## CDPE SW Delivery



## Added Capability

- Semantic Search
- Improved search GUI
- Static/moving model discovery
- Simulation-ready TRISA Threats data
- SOF Terrain discovery

- Army GFM DI force structure discovery/retrieval
- Entity type management service
- Equipment C&P discovery and retrieval
- Entity alignment service
- USAF Terrain discovery
- User Collaboration

- Intelligence data discovery
- Unclassified OPFOR C&P data discovery and retrieval
- OOB Alignment service
- C&P Alignment service
- ENV data retrieval
- ENV data enhancement services

## Added Providers

- Entity  
Army Model Exchange (AME)
- WEG class definitions

- Entity  
Army Organization Server (AOS)
- Entity C&P  
AMSAA Equipment Characteristics Database (ECDB)
- AMSAA Standard Nomenclature Database (SND)

- Terrain  
SDBF
- SOFPREP

- Force Structure  
Modernized Intelligence Database (MIDB)
- TRISA Worldwide Equipment Guide (WEG)
- NASIC





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# Ongoing Execution

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# Integrated Development Environment (IDE)



- Centralized development environment bringing M&S Communities, Co-Developers, Government team members and contractors together
- Environment provides necessary access to infrastructure, software and tools needed to promote effective software development, integration and test
- Development environment is governed by established processes
- Repository for the OneSAF code
- Is an accredited connected environment
  - Currently under DIACAP
- Control point for all EDS customer development efforts
  - Currently being developed on DI2E
  - CDPE services currently hosted at JS J7 Suffolk





# Unclassified/FOUO OneSAF Online Presence



## Public Website

- Distribution Agreement
- Account Request Info
- Help Desk Information

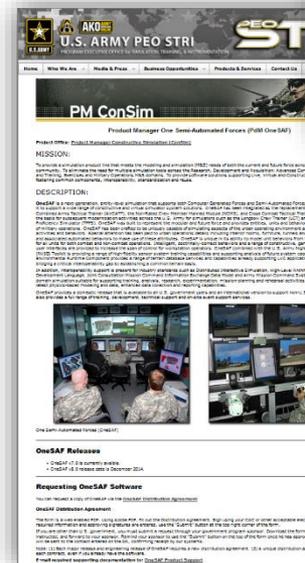
<http://www.peostri.army.mil/PRODUCTS/ONESAF/>

## OneSAF Development Site (CAC Enabled)

- Access to OneSAF Development Project Data
- Provides Team Pages into internal OneSAF Users
- Must have for Co Developers, and Heavy OneSAF Users
- URL: <https://dev.onesaf.mil>

## OneSAF RT (Ticketing System) (CAC Enabled)

- Can view history PTR Fixes in OneSAF
- Can create User Feedback Requests
- URL: <https://rt.onesaf.mil>





# Unclassified/FOUO Current Scope



- **What I2S does (not in priority order):**
  - Executes the Primary integration & test functions
  - Provides training & support to the field
  - Integrates Co Developer handovers
  - Resolves Software problems during Integration & Test
  - Executes final delivery of the product baselines
  - Manages trunk
  - Manages the IDE processes, equipment and data including all computer equipment for developers, website, and lab environment
  - Manages Information Assurance (IA) Vulnerability Management (IAVM) updates and site distribution
  - Manages and controls DoD IA policies related to the IDE facility via DoD Information Assurance Certification and Accreditation Process (DIACAP), Risk Management Framework (RMF), or other DoD approved methodology





# Unclassified/FOUO Current Scope

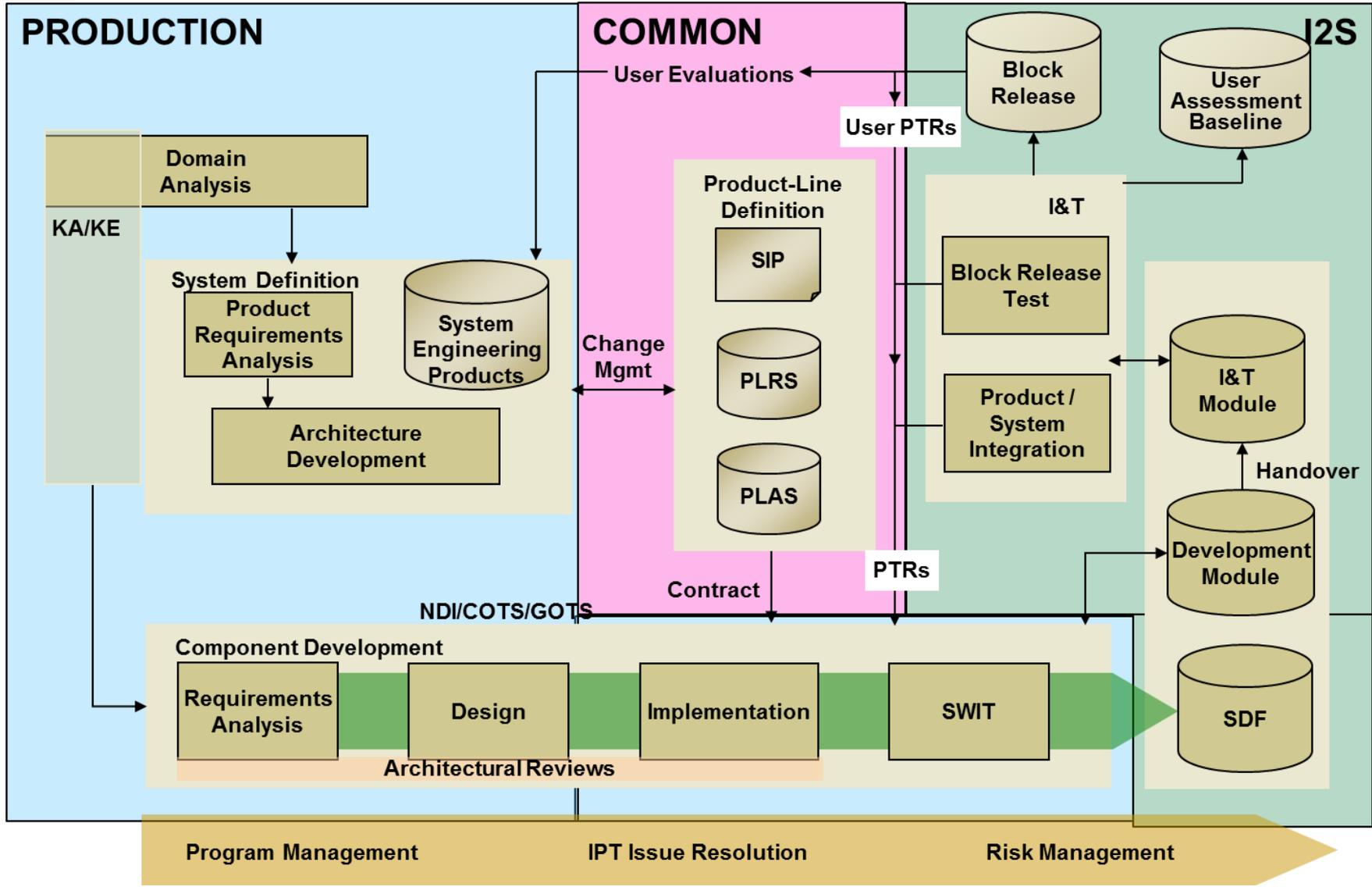


- **What Production does (not in priority order):**
  - Develops/enhances Tools, Models, Behaviors, Compositions and Services to meet requirements from:
    - New P3I software development items
    - Customer funded ECPs (SE Core, BCTM, FMS, PM Radars, etc)
  - Executes the Production Software Handover
    - Handover package includes documentation updates for the: Software Description Document, Operator Manual, Maintenance Manual, Training Manuals, PLAS, PLRS, etc
  - Manages all production software branches
  - Supports I2S with issue resolution of newly developed capabilities during:
    - Initial integration of capability into trunk
    - All testing activities for baseline releases (major, maintenance and tailored release)
  - Executes all EDS customer funded requirements





# OneSAF Systems Engineering Process





# EDS and the Defense Intelligence Information Enterprise (DI2E)



- DI2E Developer Collaboration Tools.
- Sub-project of the Defense Intelligence Information Enterprise (DI2E)
- Provided at no cost for Government programs and their supporting developers.
- User registration requires JPAS visit request (US Citizenship) and government sponsor
- Login by username and password; CAC support is planned
- Project owners control access to their content
- See
  - <https://devtools.di2e.net/>

DI2E Dev Tools

[Open an Issue](#)   [Contact Us](#)   [Sign Up](#)

Welcome to the DI2E Developer Collaboration Tools. These tools are provided for Government programs and their supporting developers. The DI2E Developer Collaboration Tools provide documentation and design artifact hosting, issue tracking, and project collaboration. The tools enable automating nightly builds and tests of software projects flagging and sending errors to development team(s) for action, automating unit and IV&V tests sending results to development team(s) upon completion, check-in/check-out capability to maintain versioning of software baselines in shareable source code and design artifact repositories. The DI2E Developer Collaboration Tools provide an environment where code produced for the government is configuration managed and buildable "on government owned property".

This DI2E Developer Collaboration Tools enable collaboration with other programs' developers, such as to report/support defects or enhancements. The owning program maintains control of read/write privileges to the source code and binaries and associated documentation, and decides when to provide access to other programs.



 **Jira - Issue Tracking, Agile Planning**  
Issue and project tracking for traditional and agile projects.

 **Confluence - Wiki, Documentation**  
Per-project, collaborative document editing.

 **Jenkins - Continuous Integration, Automated Builds**  
Automated software build, test, integration, and performance profiling

 **Nexus - Code Artifacts, Maven Repo Mirror**  
Stores software artifacts and resolves dependencies for maven builds.

 **Stash - Git Source Control**  
Distributed, efficient source control and versioning.

 **Subversion - Source Control**  
Software versioning and revision control.

 **FishEye - Code Reviews**  
Browse code repositories, comment on code, and perform code reviews.

 **Password Management**  
Reset and unlock your own DI2E password.

Our tools are supported, available, and backed by our [service level agreement](#).  
Read more about our [access control policy](#) and [program on-boarding policy](#).

<b>About Us</b> What is DI2E? ⓘ What is DI2E Framework? ⓘ	<b>Links</b> DI2E Storefront	<b>F.A.Q.</b> Our Service Commitment Our Onboarding Process Our Privacy Policy Our Terms of Service	<b>Contact Us</b> Request an Account General Questions Contact Support
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America's Force of Decisive Action

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30  SOLDIERS • FAMILIES • ARMY CIVILIANS  
**ARMY STRONG.™**



# Unclassified/FOUO DI2E Tools Available



- JIRA
  - Includes Agile plugin (a.k.a. Greenhopper)
- Confluence
- Stash
  - Web front end to Git version control system
  - Functional match with GitHub
- Fisheye / Crucible
  - Fisheye presents source code from a repository to browsers
  - Crucible is a peer review tool
- Nexus
  - Code artifact tracking and repository management (e.g., management of Maven repositories for a project)
- Jenkins
  - Supports automated builds / continuous integration
- VM Hosting

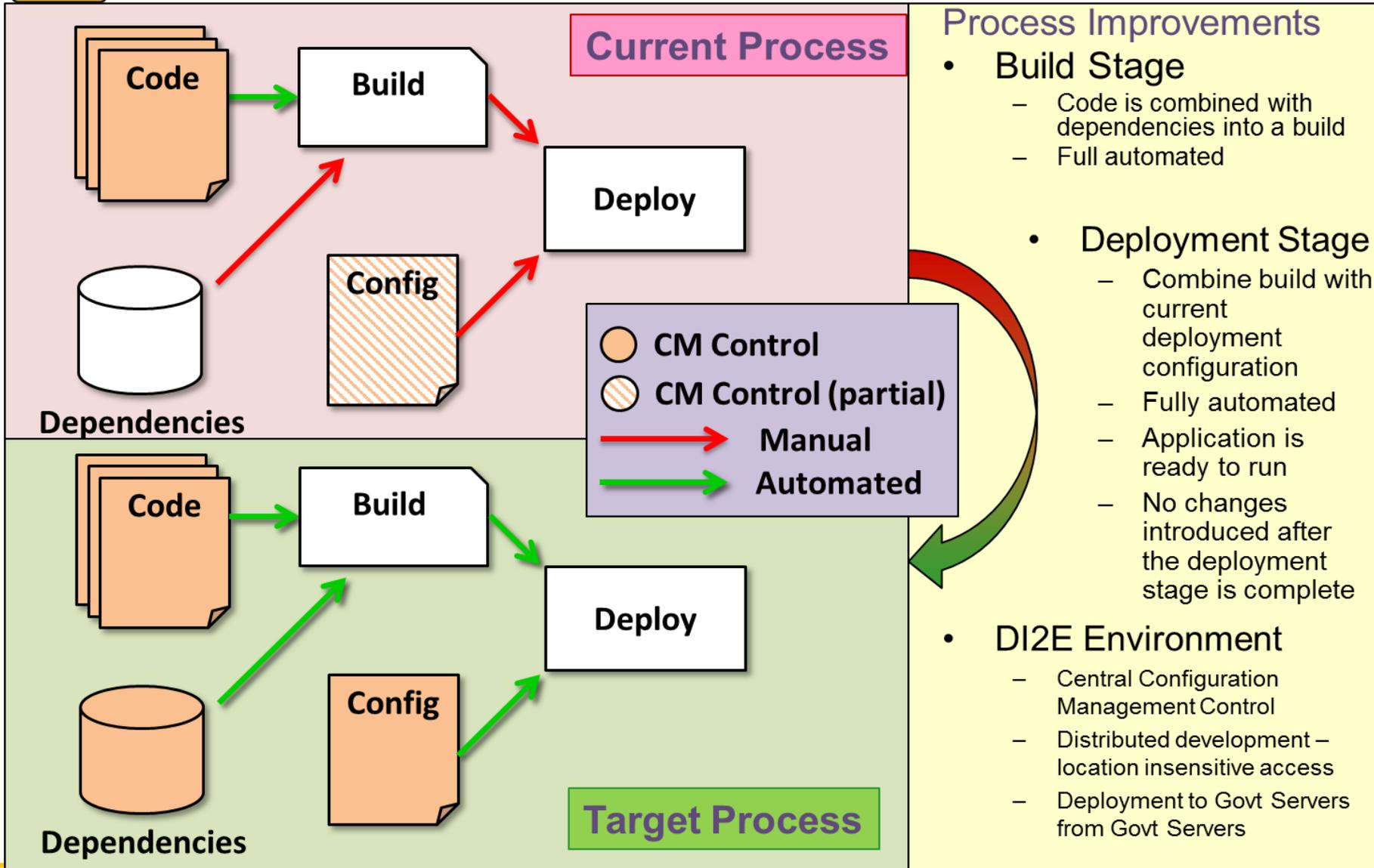
**DI2E covers  
licensing cost**

**DI2E supports  
data migration  
from existing  
servers**





# Upgrading CDPE Deployment Process





# Requirement Generation

**Bruce Robbins**





# OneSAF Program of Record Requirements Evolution



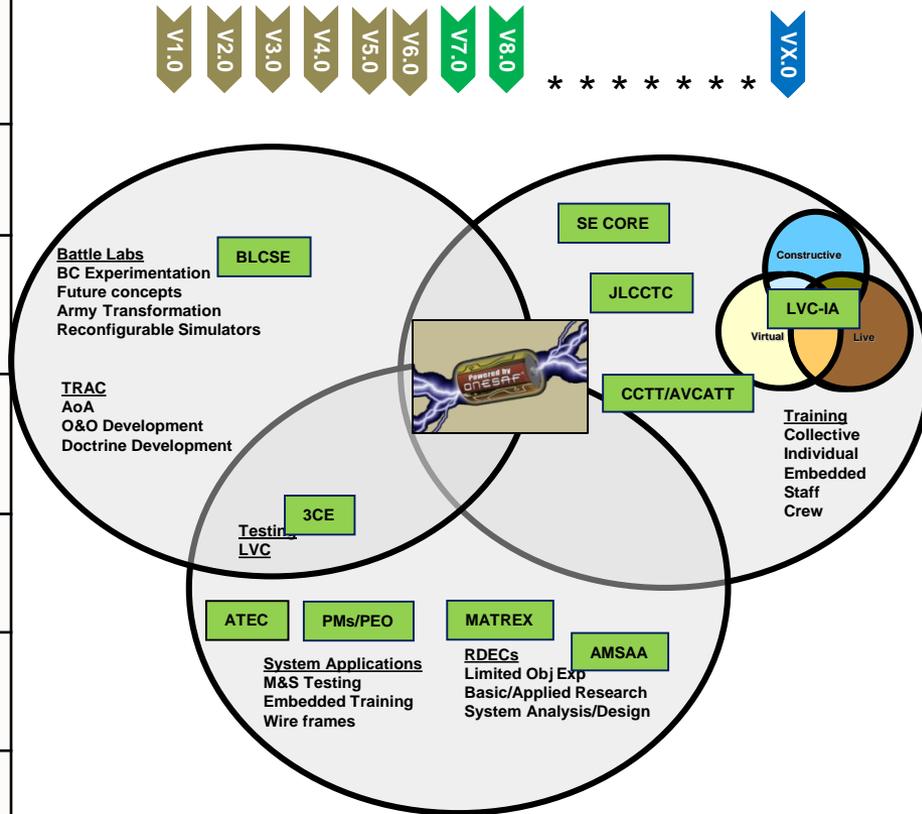
1996	1997-1998	May 2001	Aug 2004	June 2006	July 2006 - Present	2015- 2021
DUSA-OR Directed CGF/SAF Study	OneSAF MNS, ORD v1.0	ORD v1.1 approved TRADOC	Army G-3 approves OneSAF ORD v1.1	GAT (and regression test)	Version Releases Based on TRADOC Approved Requirements and Concurrency Updates	Version Releases Based on TRADOC Approved Requirements, IA and Concurrency Updates

Draft

Finalize

Prioritize

<b>KPP #1</b> System Capability	<ul style="list-style-type: none"> <li>in-the-loop, human in the loop, dist/non-dist</li> <li>•Synthetic Environment – weather, chem/bio/nuclear/obscurants, MOUT, illumination</li> <li>•Scenario Generation – semi-automated</li> <li>•System Capability – minimize network and internal simulation load</li> </ul>
<b>KPP #2</b> Automated Units & Behaviors	<ul style="list-style-type: none"> <li>•BLUFOR – Indv/platform to BN, CMD entity at Bde, CS, CSS, CAS, JA/AT, SEAD, NSFS Effects</li> <li>•OPFOR – Indv/platform to BDE, CMD entity at DIV</li> <li>•Suppression Effects – Direct and indirect fires</li> </ul>
<b>KPP #3</b> Composability	<ul style="list-style-type: none"> <li>•Database Manipulation – Create/modify/delete units, weapons, platforms, symbols</li> <li>•Scalability – minimum 25 sides, terrain scale (e.g. 300x300 – 1:50k), nested terrain</li> <li>•Modes of Operation – HITL – RT, HITL – NRT, NHITL – NRT, Simulator-Network, Repeatable, Replication</li> </ul>
<b>KPP #4</b> Interoperability	<ul style="list-style-type: none"> <li>•Constructive Simulations – terrain correlation, resolve LOS between models</li> <li>•Virtual Simulation – capable of retiring AVCATT/CCTT SAF</li> <li>•Live Simulations (C2) – stimulate and stimulated by Army ABCS systems</li> <li>•Standards – full HLA compliance and DIS</li> </ul>
<b>KPP #5</b> Exercise/Study Support	<ul style="list-style-type: none"> <li>•Data Collection, Analysis &amp; AAR – multiple output, filtering, storage and visualization</li> <li>•Control – faster than real-time, checkpoint, restore, pause</li> <li>•Exercise &amp; Study – facilitate Staff Exercises and study efforts for all three domains</li> </ul>
<b>KPP #6</b> Extensibility	<ul style="list-style-type: none"> <li>•Terrain Format - SEDRIS</li> <li>•Software – commercial PCs, V&amp;V, not hard coded, variable fidelity, supports extension, no hard coded data</li> <li>•Documentation – user guide, maintenance manual, programmer’s manual, V&amp;V, overview</li> </ul>
<b>KPP #7</b> Physical Phenomenology	<ul style="list-style-type: none"> <li>•Physical Models – e.g. – Tgt Acq., Delivery accuracy, rate of fire, vulnerability, etc.</li> </ul>





# Requirements Generation Process



User Community Internal Requirements Generation: Experimentation, T&E, Intelligence, Training, Analysis, Acquisition gather requirements from their customers.

*Throughout the Year*

User community provide their consolidated list of requirements to TPO OneSAF

*~ NLT Mid-April*

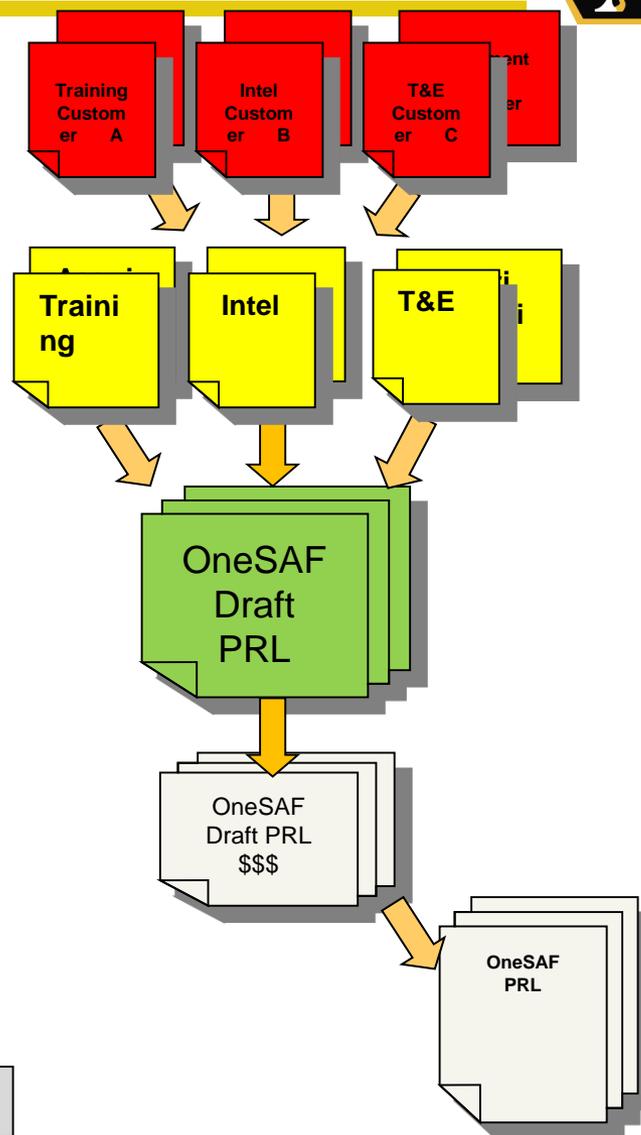
TPO OneSAF merges these lists into a single list called the Draft OneSAF Priority Requirements List, with a best guess prioritization, and send to domains

*~ NLT End of April*

PM OneSAF costing (ROM) of PRL

OneSAF Requirements Prioritization Board Council of Colonel.

PM OneSAF begins development on next version





# EDS Capability Development Process



## Operational Readiness Exercise / First Use

Developer supported event ran by user not material developer

## Validation, Verification & Accreditation

Regulatory validation and acceptance of new version

## Test Events

Controlled testing of coded and integrated requirements

## Development

Material developers code and integration of requirements

## Requirements Control Board

Unconstrained requirements

## Configuration Control Board

Constrained requirements

## Concept Conference

refinement of requirements

## Synch Session

specific discussions on how to implement refined requirements

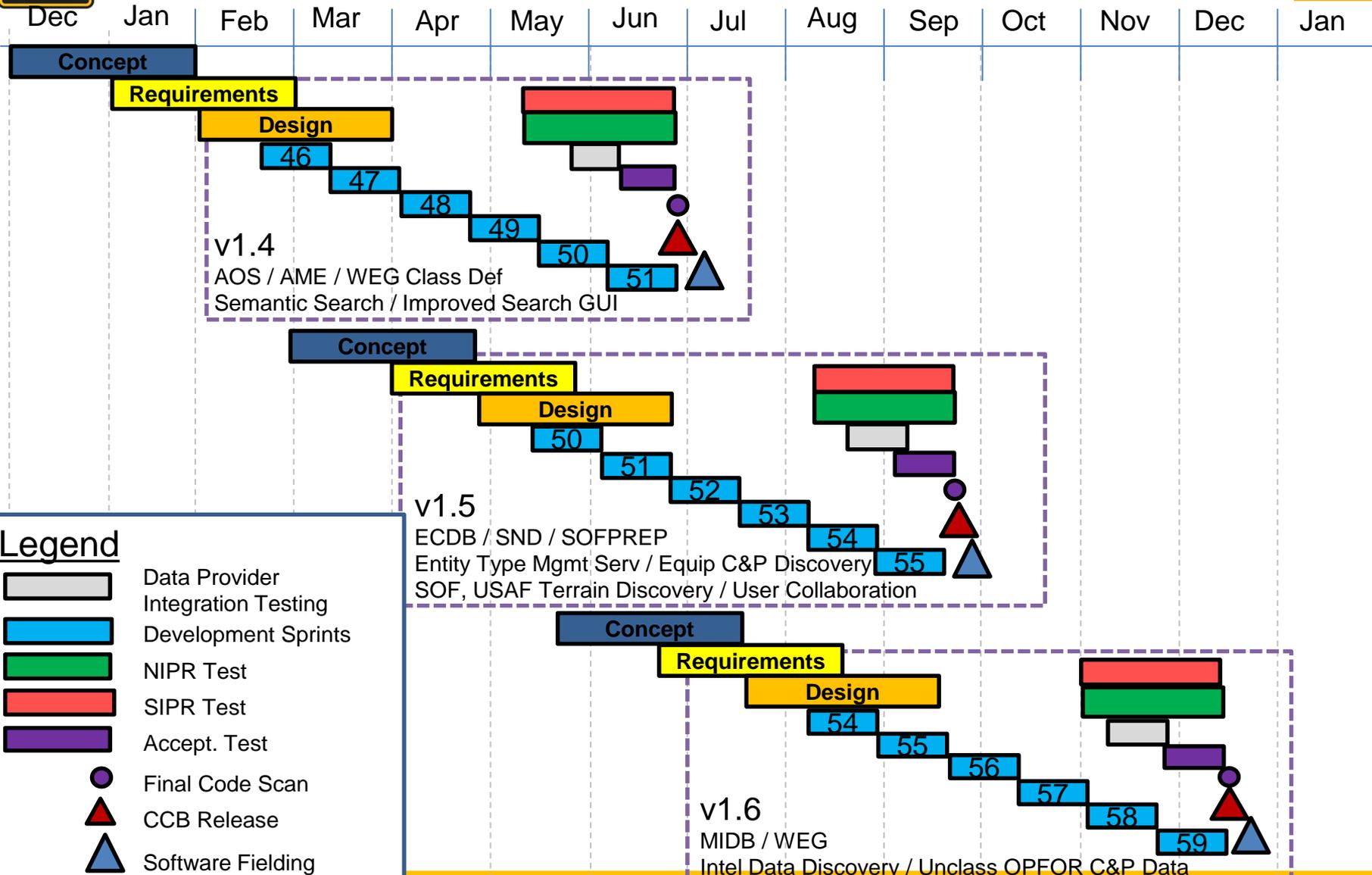
## Design Sessions

Discussion/White Papers of implementation





# EDS – SE & Development CY15



## Legend

- Data Provider
- Integration Testing
- Development Sprints
- NIPR Test
- SIPR Test
- Accept. Test
- Final Code Scan
- CCB Release
- Software Fielding

### v1.4

AOS / AME / WEG Class Def  
Semantic Search / Improved Search GUI

### v1.5

ECDB / SND / SOFPREP  
Entity Type Mgmt Serv / Equip C&P Discovery  
SOF, USAF Terrain Discovery / User Collaboration

### v1.6

MIDB / WEG  
Intel Data Discovery / Unclass OPFOR C&P Data  
QOB Alignment Serv / ENV Data Retrieval



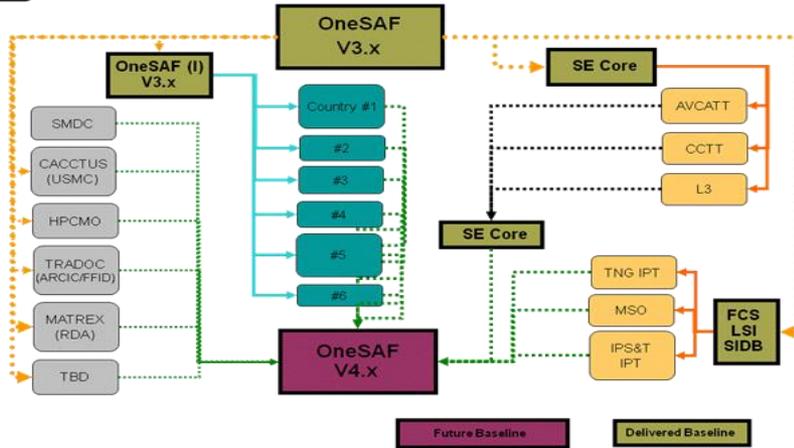


# Engineering Principles



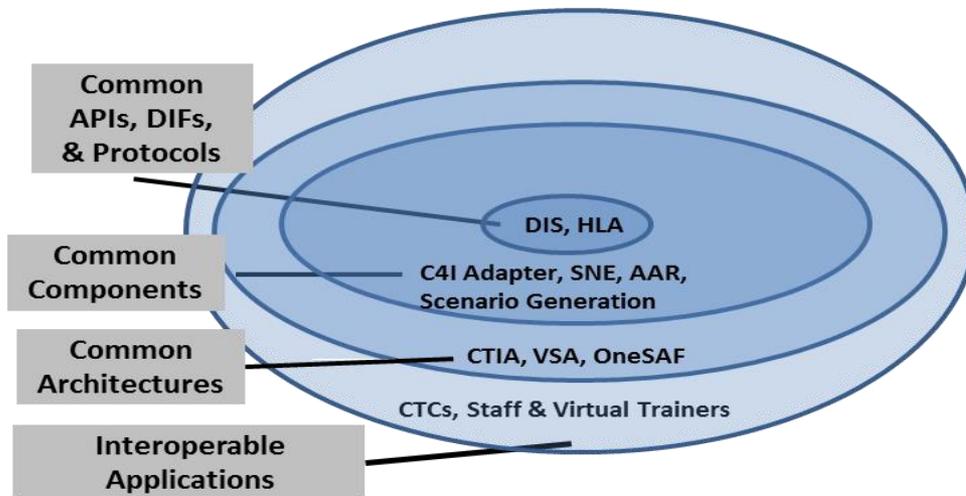
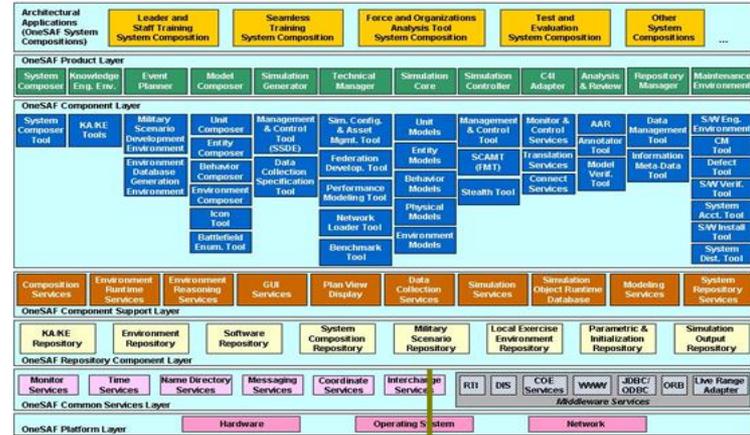


# Unclassified/FOUO State of the Art Design



Standardized Configuration Management

## OneSAF Product Line Architecture Framework



- **JAVA CODE BASE**
- **LINUX / WINDOWS O/S**
- **OPEN SOURCE**
- **MODULAR DESIGN**
- **INTEROPERABLE**
- **DOCUMENTED**

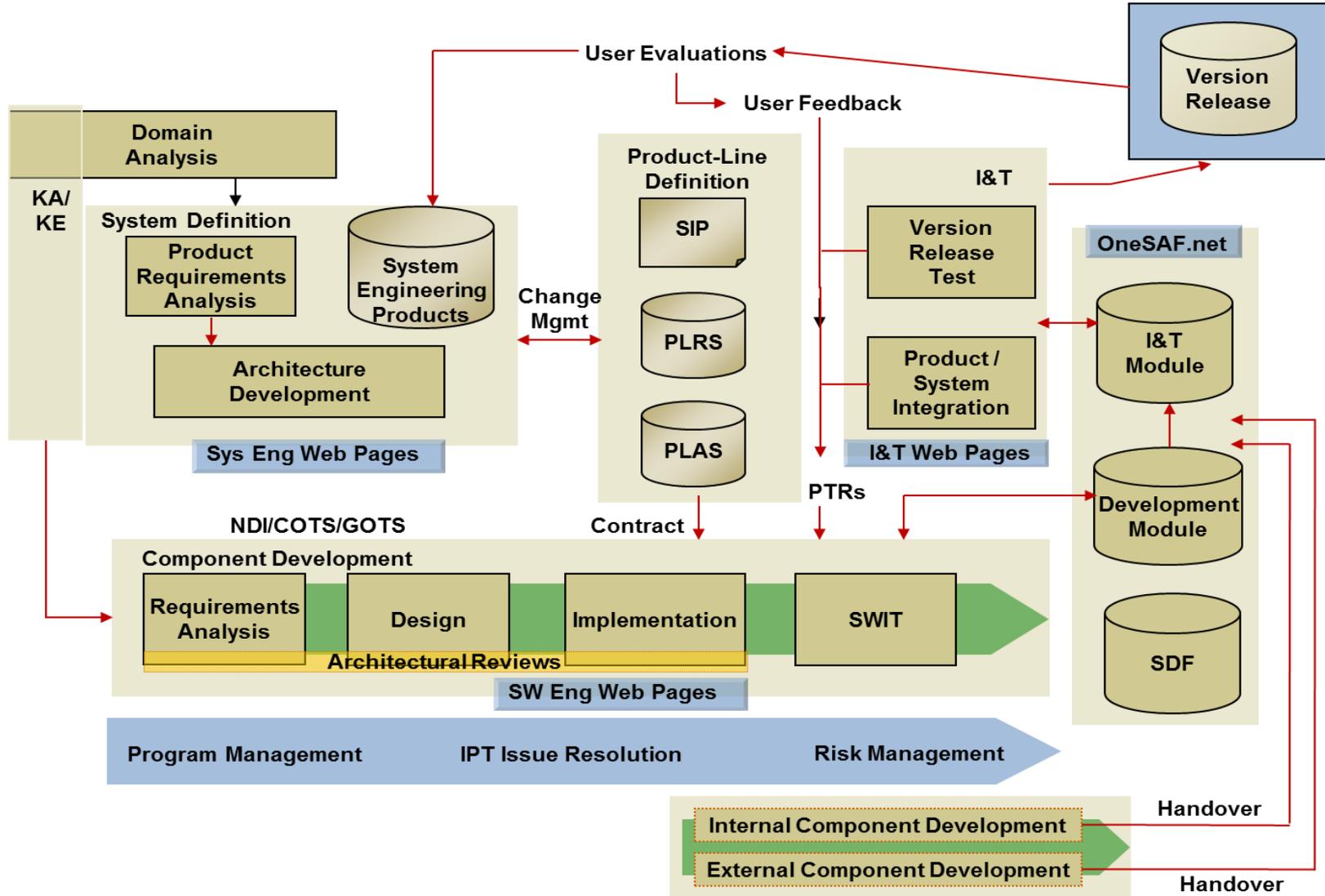
## Paving The Way To The Future (on Standards)





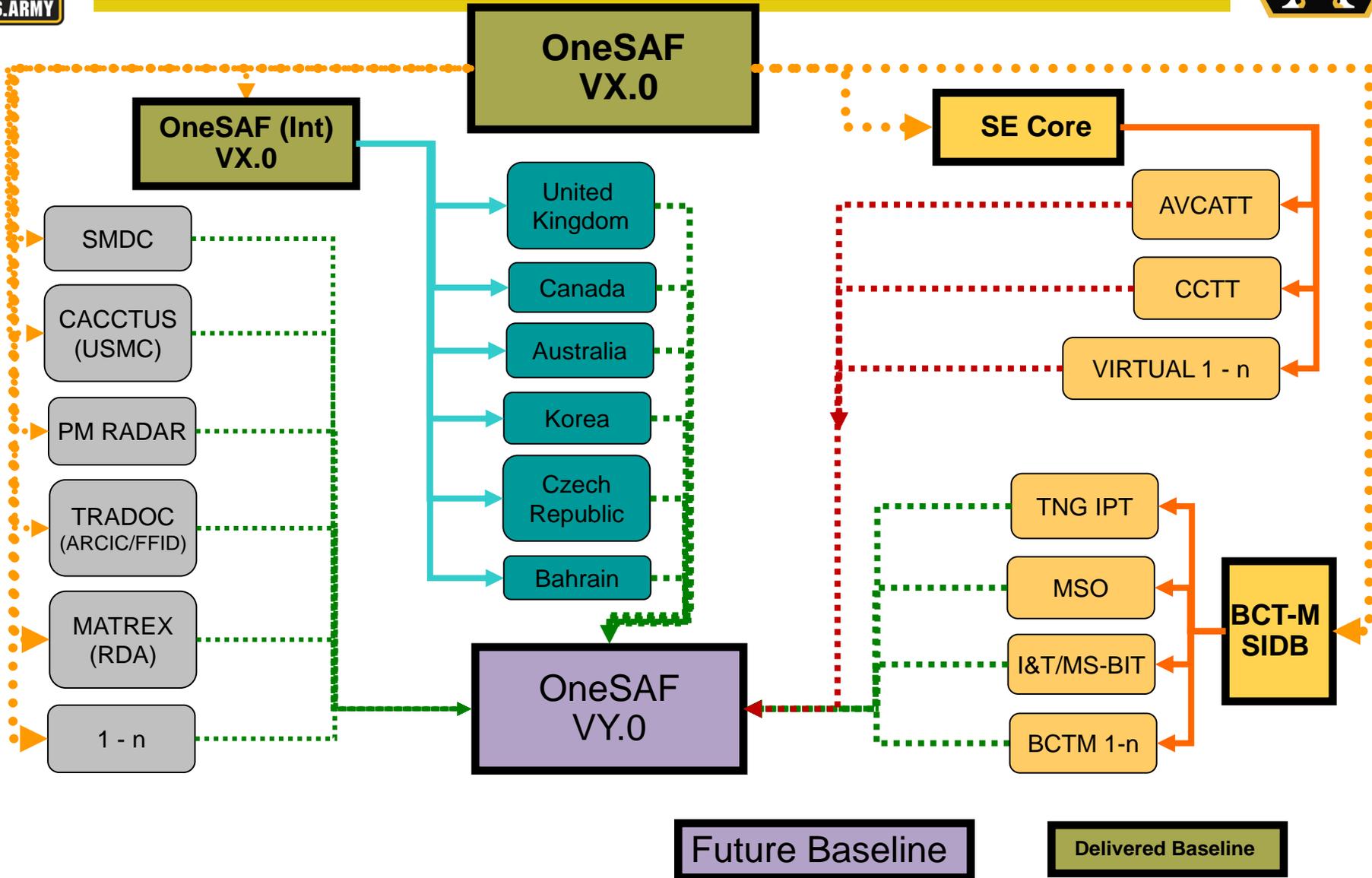
# System Engineering Process

Electronic Process Guide (EPG)



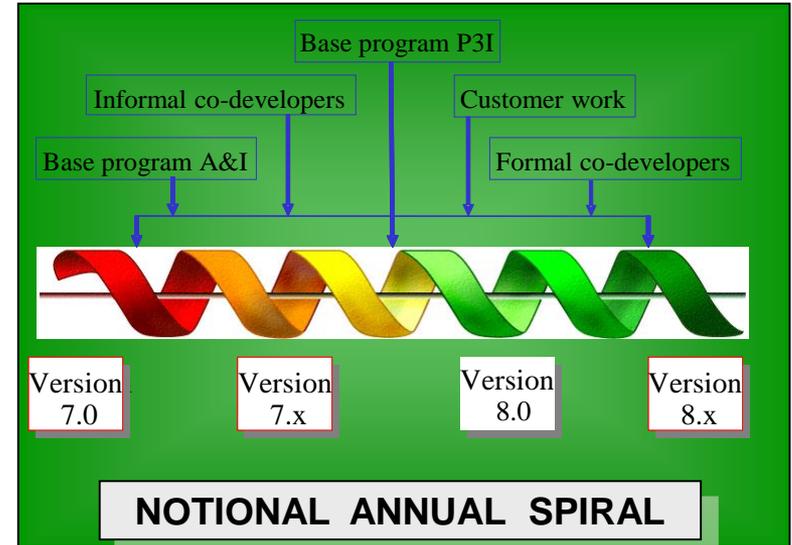
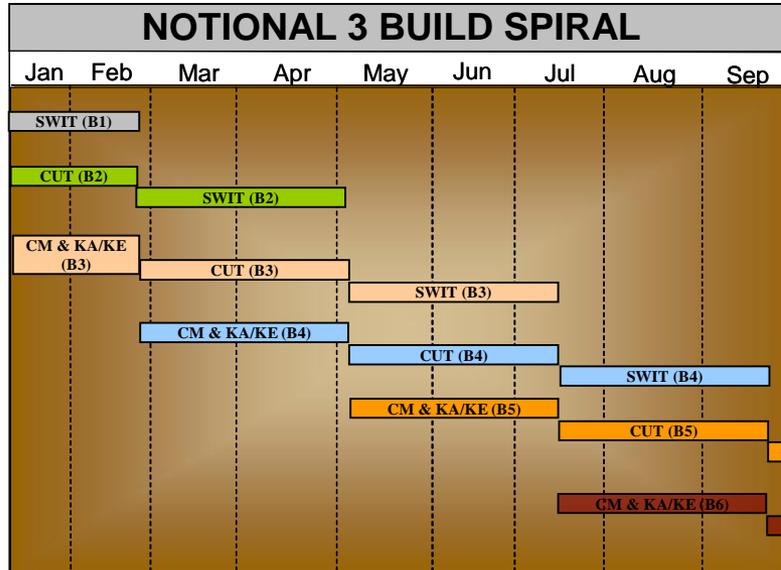


# Configuration Management





# OneSAF Development Processes



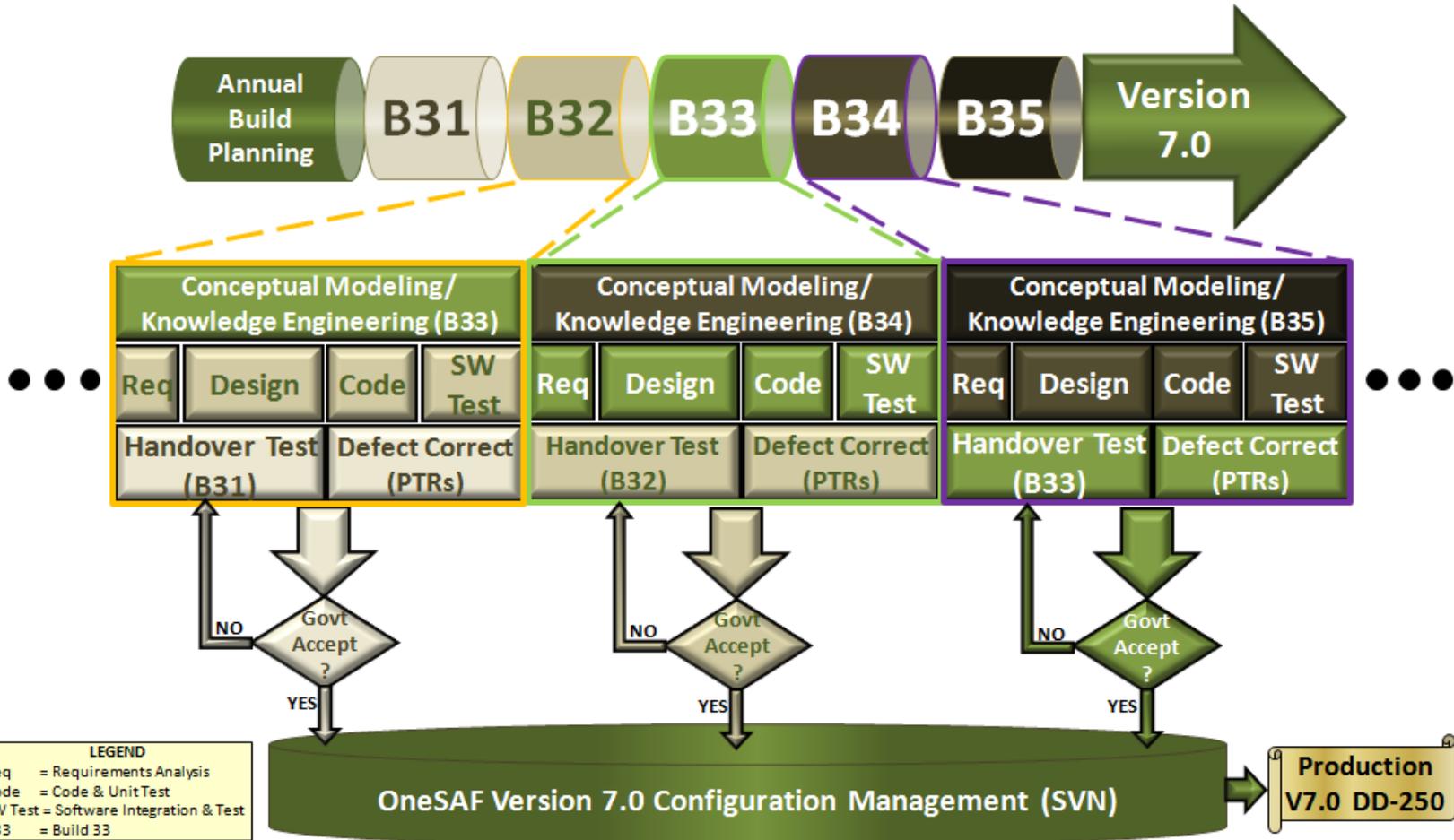
- Three concurrent activities
  - Conceptual Modeling/Knowledge Acquisition
  - Code and Unit Test
  - Software Integration and test
- Each activity feeds the next
- Each build results in completion of added capability

- One major release each year (vX.0)
  - Combat developer led test event
  - Culmination of annual development activities
- One or more “dot” releases each year
  - Based on user needs
  - Based on new capability
- Multiple injects from external activities





# Software Development





# Unclassified/FOUO Build Processes

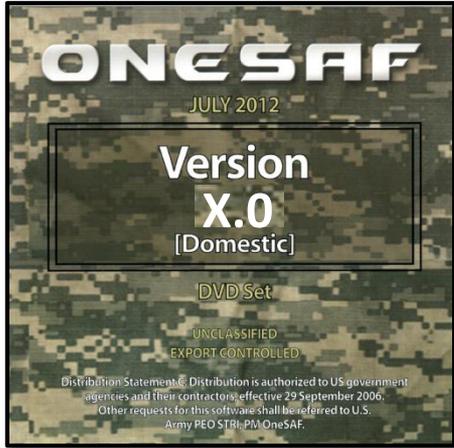


- **Peer Reviews**
  - Mechanism for TPO/Community/Stakeholder participation into the development cycle. Conducted via the RT, with additional face to face meetings.
- **Build Associated meetings** (Build Kick Off, Co-Developer & Mid Build)
  - Coordination with internal and external developer activities for the development cycle
  - Coordinate handovers from co-developers
  - Planned schedules for integration of effort
  - Identification of dependencies and risk
- **Continuous Integration - EIR**
  - Daily review of ptrs and change requests planned to be integrated into the software baseline, AKA Trunk.
  - Quality check to ensure all development processes have been followed
  - All developers on trunk represented
- **Engineering CCB**
  - Conduct technical assessment of integrations impacting the baseline (e.g., hardware/software baseline changes, external integration)
  - Make recommendation to the CCB regarding content of the release baseline (i.e., v6.0, v7.0, v8.0...)
  - Usually conduct multiple to eliminate tidal wave build up for review.

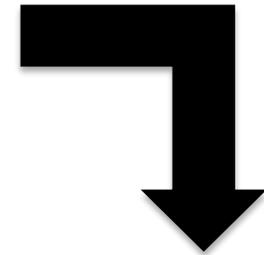




# OneSAF Co-Developer Process



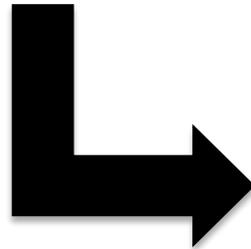
External Organization's  
Specific Software  
Enhancements



Prioritize | Integrate  
Test



Provide Back to  
PdM OneSAF



Includes  
their Work





# Co-Developer Handover Criteria



## Integration with OneSAF

- It is expected that handovers are submitted for the purpose of integration into OneSAF and are ready for integration.

## Development baseline

- Capabilities should be developed against the most recent available release.

## Architectural compliance

- Handover products should comply with architectural and design guidelines, protocols, and OneSAF Standards.

## Testing

- Capabilities must be tested and results recorded during development to ensure that they operate as designed.

## Classification

- At present, all handover products must be unclassified.

## Releasability

- All handover products must specify any releasability restrictions sensitive to international releases.





# Recent Co-Developer Handovers



- OneSAF 8.0 included the following handover integrations
  - AVCATT Handover(s)
  - TRISA - Alternate Communication Model (ACM) & UAV Seizure functionality
  - OneSAF Radar Training Support (ORTS)
  - Replication Tool Enhancements
  - Enhancements to Threats Cellular Network Models (CNM)
  - Updates to Computer Network Operations (CNO)
  - EDCSS – Addition of alternate weather support
  - WebMSDE additional capability
- OneSAF 8.5 will include the following handover integrations
  - SIMCI Next Generation Simulation to MC Interoperability
    - Interoperability: C-BML, Interop and MSDL Enhancements
  - CACCTUS
    - Integrated the C4I changes made by CACCTUS into MCA
  - SE Core / CCTT
    - Capability to change entity compositions within a unit
    - Layer capability to allow SAF operator to view VBS training areas





# Base Program Work



- Formal capability development (Requirements Integration Board (RIB))
- Concurrency development
  - Standard File Format
  - Mission Command
  - Synthetic Environment
- PTR Support
- Handover Release support
- Test & Release Support
- Customer support





Unclassified/FOUO  
**V8.5 RIB Capabilities**



**RIB 1: Commander's View Display**

**RIB 2: Classified Data Ingestion: Documentation of Data Loading Process (CDD)**

**RIB 8: Performance Data Collection / Cloud Computing**

**RIB X: V9.0 Hardening / Enhancements**

**Unit Level Entities (ULE)**

**Web Tools Enhancements – WCT, WebMSDE, WebAAR**

**Common Operating Environment (COE) V2 Compliance**

**Standard File Format (SFF) Concurrency**

**Synthetic Natural Environment (SNE) Concurrency**





# General Customer Support



- **Addresses a wide variety of issues and ‘how do I’ questions.**
  - Installation
  - Training
  - Scenarios
  - Model development
  - Knowledge Engineering
  - Software Development
  - Databases
  - Operation
  - Exercises
  - Knowledge acquisition
  - System Administration
- **Most prevalent questions addressed :**
  - Installation/media
  - IDE
  - Terrain database
  - General info/data requests
  - Tools Operation (MCT, SCAMT, MSDE, etc)
  - DIS and HLA
  - Behavior Models





# Specific Customer Support



- Directorate of Simulation (DoS) Fort Rucker
  - Utilizes OneSAF as the Constructive simulation trainer for CPX/WFX
  - Used for Captain's Career Course for both ground and aviation based exercise
  - BDE level training audience with 5-7 BN's supporting
  - Replaces JANUS
- MTC, Fort Riley
  - Utilizes OneSAF to conduct TRADOC POIs for MC systems training (CPOF, JCR, AFATDS, etc)
  - Utilizes OneSAF to provide BN staff training
- Maneuver Center of Excellence (MCoE) Fort Benning
  - Initial investigation/integration as a JCATS replacement
  - Interoperated with VBS3, JCATS, CPOF, FBCB2
  - Full-up integration in 4Q15 to support BN CPX for Captain's Career Course
- Virtual
  - OneSAF is used as the common SAF to provide synthetic forces for virtual training devices (AVCATT, CCTT, NCM3)
  - OneSAF is utilized as the SAF within the Longbow Crew Training (LCT) systems by PM Apache/PM Cargo

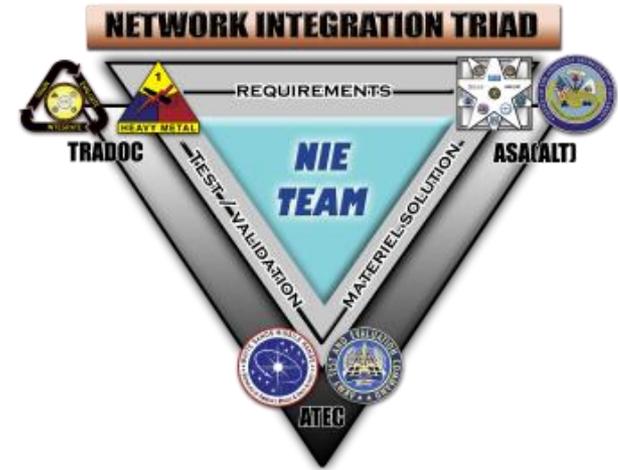




# Network Integration Events (NIE)



- **NIE employs an LVC environment with OneSAF as the core driver for operational realism:**
  - Series of events for SUT/SUE testing, CPX training (2/1AD, JTE), and experimentation (Bold Quest)
  - OneSAF employed by multiple partners (BMC, ASA(ALT) Always On, MTCs, OTC) and sites (Redstone, FBTX)
  - Used to provide a wrap-around BDE/DIV environment
- **OneSAF team embedded within the NIE triad processes since 12.2:**
  - Heavy coordination with BMC Mission Command Complex (MCC), Operational Test Command (OTC), and PEO C3T
  - Provide lifecycle onsite support from planning to execution
  - M&S federation with ExCIS, IMASE, VBS2, TAPETS, CDS3 (across distributed sites, tactical & sim networks)
- **NIE simulation environments feature:**
  - LVC distributed architecture featuring M&S systems across PEO STRI and other Army/Joint agencies
  - Sim/stim with emerging COE systems/networks
  - NIE 16.1 unfolding into Army Warfighting Assessment construct with expanded Joint and coalition participation

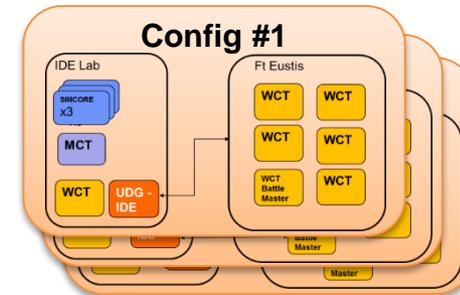




# BLCSE Modernization OneSAF(BMO)



- **OneSAF has been the ground maneuver model for BLCSE since OneSAF v2.0**
  - OneSAF is currently supporting 15.2 SimEX
  - Provide lifecycle support from planning to execution
  - Tightly coordinated with JAMSD and Battle Labs
  - Federated with other such as OneSAF clusters running remote battle labs, FireSim, ATCOM, EADSIM
- **ARCIC futures initiated BLCSE Modernization efforts with OneSAF to implement BLCSE Cloud transition**
  - Created a SW baseline supporting virtualization activities
  - Support BMO testing and future SimEX utilizing a Cloud/Virtualization architecture





# OneSAF Support of International Activities



PURPOSE	METHOD	SPONSOR AGENCIES	COLLABORATIVE ORGANIZATIONS	PAST / CURRENT ACTIVITIES	PENDING / FUTURE
<b>BUILD CAPABILITY</b>	FMS RDTE MOUs PAs NATO M&S GROUPS	 		AUSTRALIA BAHRAIN CANADA CZECH REPUBLIC EGYPT ISRAEL NEW ZEALAND SLOVAKIA UNITED KINGDOM SINGAPORE UK PA	UK PA Follow-on  NATO Countries NATO COEs  System PMs EX: PM Apache  SINGAPORE PA
<b>PROMOTE STANDARDIZATION</b>	NATO CAX FORUM TTCP TP TTCP FAs SIWs	  	  	MSG-048 (CBML) MSG-069 (Irr. Warfare) MSG-076 (LVC) MSG-079 (CBML) MSG-081 (SYN WRAP) MSG-085 (C2 STDS) MSG-086 (CBML)  FA3 CGF FA4 SNE	DATE  MSG TBD (CBML)  ABCA PA
<b>ENABLE INTEROPERABILITY</b>	Experimentation ABCA Working Groups			Allied Auroras CAGE TS/Omni-Fusion	NIE 14.2 BOLD QUEST CAGE III





# EDS – Activities





# Development Plan – CY15



## Common Data Production Environment (CDPE)

### OOB Data

- Authoritative force structure data
- Characteristics & performance data
- Electronic OOB data
- 2/3-D Static & moving models
- OOB data services

### ENV Data

- Integrated and correlated terrain data
- Terrain data retrieval
- Terrain data enhancement services

### Usability

- Improved graphical user interface (GUI)
- Semantic Search
- Improved search results visualization

### Collaboration

- Promote data reuse
- Promote trust between providers and users
- Promote best practices
- Promote standards convergence

### Coalition

- Support Mission Partner Environment (MPE) data sharing objectives
- Authorized access





# EDS – Data Providers

**Where we are going now and in the future**





# CY15 Plan Capability – Data Provides



## Classified Characteristics & Performance Data (C&P) (AMSAA)

 **AMSAA** Access to Authoritative Systems Performance Estimates  
Excellence in Analysis

- ❖ Standard Nomenclature Database (SND) – list of standard system names to ensure we deliver what the customer needs
- ❖ Equipment Characteristics Database (ECDB) – descriptions of SND systems to ensure consistent assumptions

## Unclassified 2/3-D Static & Moving Models (AME)

Promote model re-use for all DoD agencies involved in M&S

- Ground
- Air/Air Defense
- Naval
- Life Forms
- Non-military Vehicles
- Obscurants
- Vegetation
- Buildings
- Bridges





# CY15 Plan Capability – Data Provides



## Correlated Terrain Data (SOCOM SOFPREP, USAF SDBF)



**USSOCOM Special Operations Forces Planning, Rehearsal, and Execution Preparation (SOFPREP):** Classified, enhanced precise Geospatial-Intelligence (GEOINT) data for SOF



**Simulator Database Facility (SDBF):** USAF library of visual and sensor datasets and a common resource.

## National Air & Space Intelligence Center (NASIC) Data



National Air & Space Intelligence Center provides intelligence on foreign air and space forces, weapons, and systems including assessments of aerospace performance characteristics, capabilities, and vulnerabilities.





U.S. ARMY

# CY15 Plan Capability – Data Provides



## Modernized Integrated Database (MIDB) Non-US Intelligence Data



The Defense Intelligence Agency (DIA) MIDB is the current year repository for military intelligence of worldwide OOB, facilities, C2 networks, targeting, battle damage assessments

## World-Wide Equipment Guide (TRISA)



Authoritative source for unclassified OPFOR military systems, variants, and upgrades that U.S. forces might encounter now and in the foreseeable future based on real-world developments and trends

## Army Organizational Server (AOS) OOB Data



Authoritative source for authorized Army force structure data that reflects historical, present and future Army force structure authorizations from worldwide down to individual billet and equipment





# Exploring Access (1 of 2)



<b>NGIC JACOB Intel</b>
<b>ArCADIE Architecture Data</b>
<b>Military Equipment Parametric and Engineering Database (MEPED)</b>
<b>US Army Europe Geospatial Planning Cell</b>
<b>Logistics Information Warehouse (LIW) Logistics Data</b>
<b>VBS 2/3 Run-Time Terrain Data (Milgaming)</b>
<b>USMC GEOFidelis Data</b>
<b>Army Space &amp; Missile Defense Center (SMDC) Data</b>
<b>TRISA Operational Environment (OE) Data</b>
<b>Joint Operational Planning and Execution System (JOPES) Data</b>

**SIPR**

**SIPR & NIPR**

**NIPR**

**Coalition**





Unclassified/FOUO  
**Exploring Access**



<b>JTDS Terrain Generation Services (TGS) Data</b>
<b>Night Vision Labs Data</b>
<b>Korean Battle Sim Center OOB/Environmental Data</b>
<b>National Geospatial Agency (NGA) Environmental Data</b>
<b>United States Geological Survey (USGS) Data</b>

**SIPR**

**SIPR & NIPR**

**NIPR**

**Coalition**





# Exploring Access - Allies



United Kingdom OOB/ENV Data



Canadian OOB/ENV Data



Germany OOB/ENV Data



Australia OOB/ENV Data



France OOB/ENV Data



Netherlands OOB/ENV Data



New Zealand OOB/ENV Data





# Notional Architecture

