Army

Office of the Chief Systems Engineer (OCSE)

NDIA SE Conference

"Engineering Complex Systems"

23 Oct 2012

Mr. Terry Edwards

ASA(ALT) Office of the Chef Systems Engineer (OCSE)

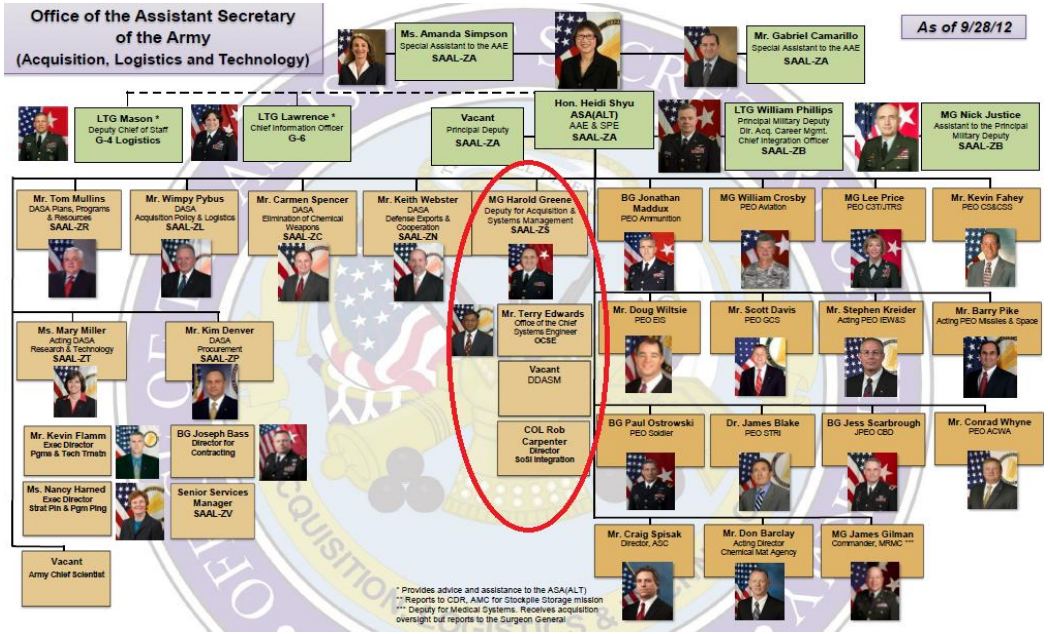
Systems of Systems Engineering
Mission / Focus

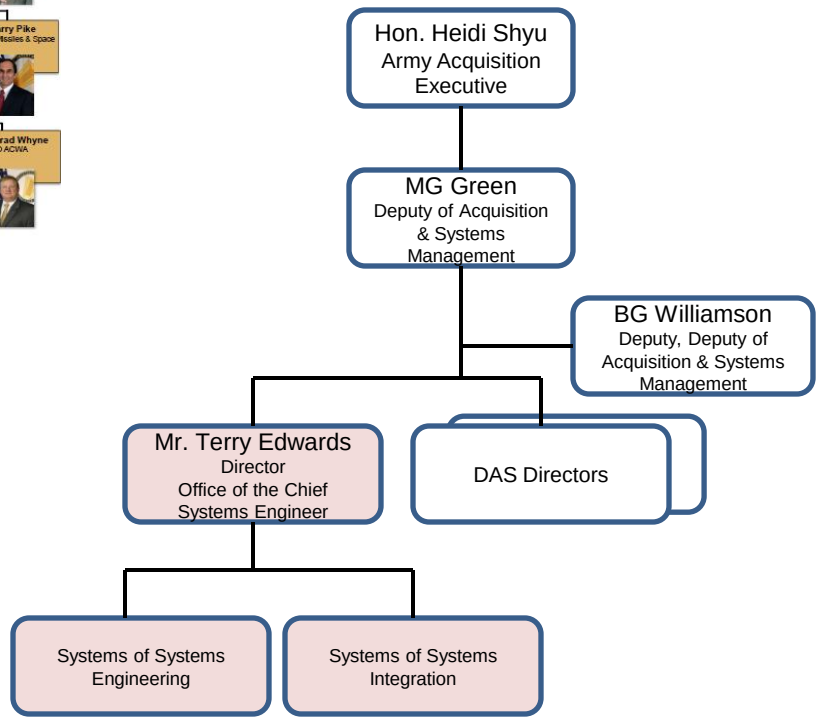
The Mission of ASA(ALT) OCSE: *Provide the Army's leadership and materiel developers with the necessary system of systems analysis defining engineering and architectural products to manage and shape the Army's materiel portfolio; to ensure Systems Engineering discipline across the Materiel developer community throughout the acquisition life cycle and grow the System Engineering capability within the Army – through education, engineering policy, guidelines and adoption of best industry practices.*

Our Focus:

- **Deliver strategic level System of Systems Engineering (SoSE) and architectural analysis for current and future force capabilities.**
- **Common Operating Environment (COE) Orchestration and Validation & Verification (V&V)**
- **Identify science and technology opportunities that will enhance the SoS capability.**
- **Foster the environment for information transparency and collaboration for all architectural and engineering data.**
- **Conduct program reviews to ensure compliance to established architectures and standards.**
- **Shape SoS engineering organizational structure and processes across the PEOs to ensure consistence in implementation.**
- **Establish engineering policy, guides, best practices templates and metrics to insure SoS discipline across ASA(ALT).**
- **Promote education and personnel development model to cultivate the SoSE capability across the ASA(ALT)/Army.**

ASA (ALT) Organization





Systems
Capability Development Reference Framework

Inter-Agency
Coalition
Joint
Army

1 2 3

•NETOPS
•Cyberspace
•Spectrum
•Waveforms

•Terrestrial
•Wireless (Cellular, WiFi/WiMax/Mesh)
•Satellite

TRANSPORT

Transport & Services

Applications & Services

APPLICATIONS

Sensors & Services

SENSORS
•Aerial/Ground/Space
•Manned/Unmanned
•Senser CE

Network Infrastructure Components

4


Building


Command Post


Tactical Wheeled Vehicles/Ground Combat Vehicles


Aviation


Soldier


Robotics


Munitions

Platforms

5


Installations


FOB

XXX
CORPS
Corps

XX
DIV
Divisions

X
HVY BCT
X
X
INF BCT
BCTs
•Heavy
•Stryker
•Light Infantry
•Support, Aviation, Fires

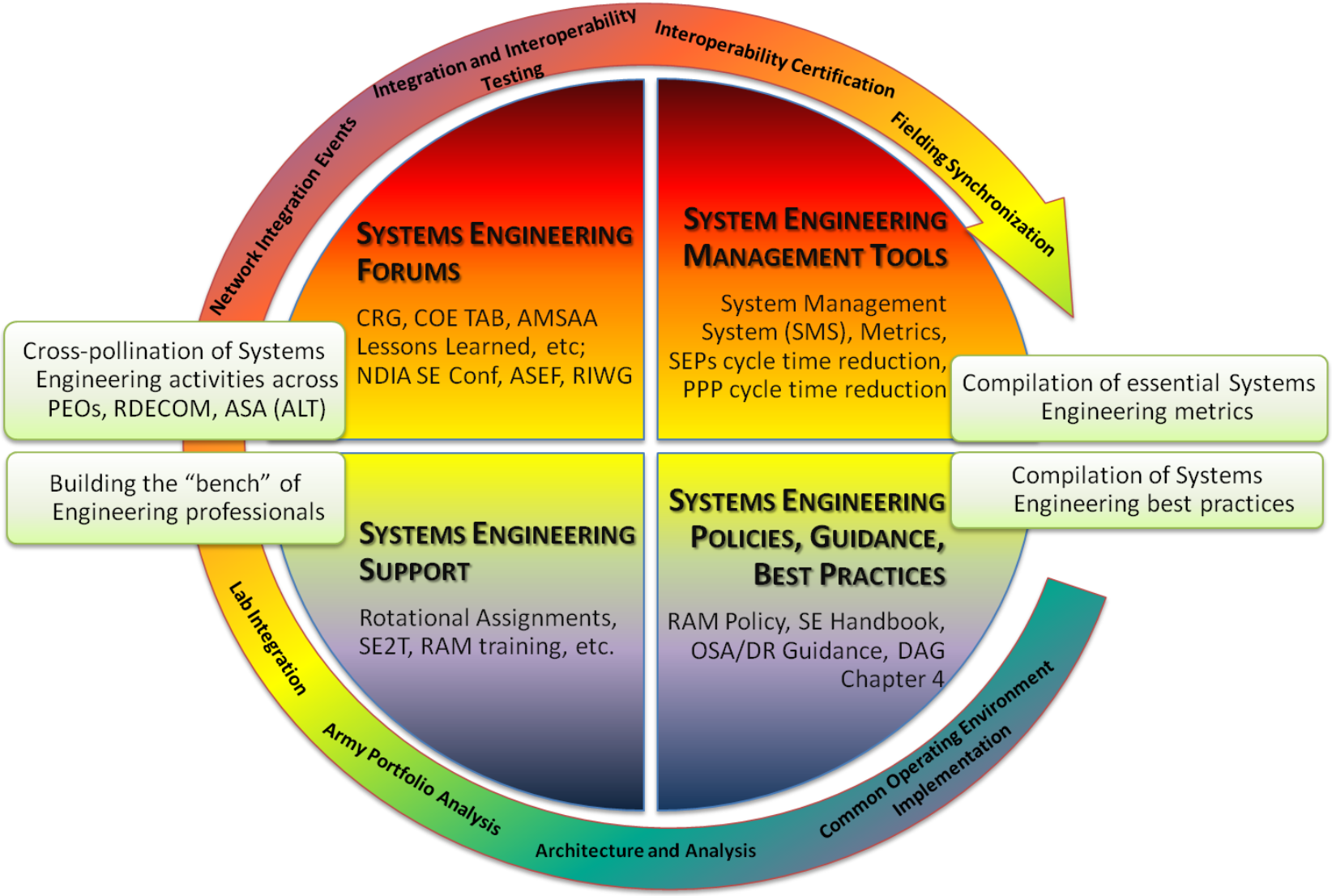
Formations

6

Missions

V5.010/03/12

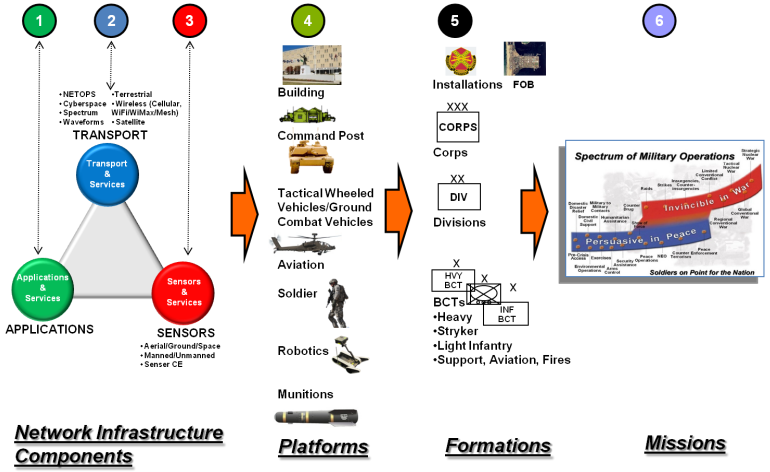
OCSE System Engineering Process



Key SE Initiatives

- Common Operating Environment
- Authoritative Reference Architectures
  - Architecture & Analysis
  - Development Planning
- SoS Engineering & Integration
- Acquisition and Engineering Support
- Human Capital development “Build the Bench”

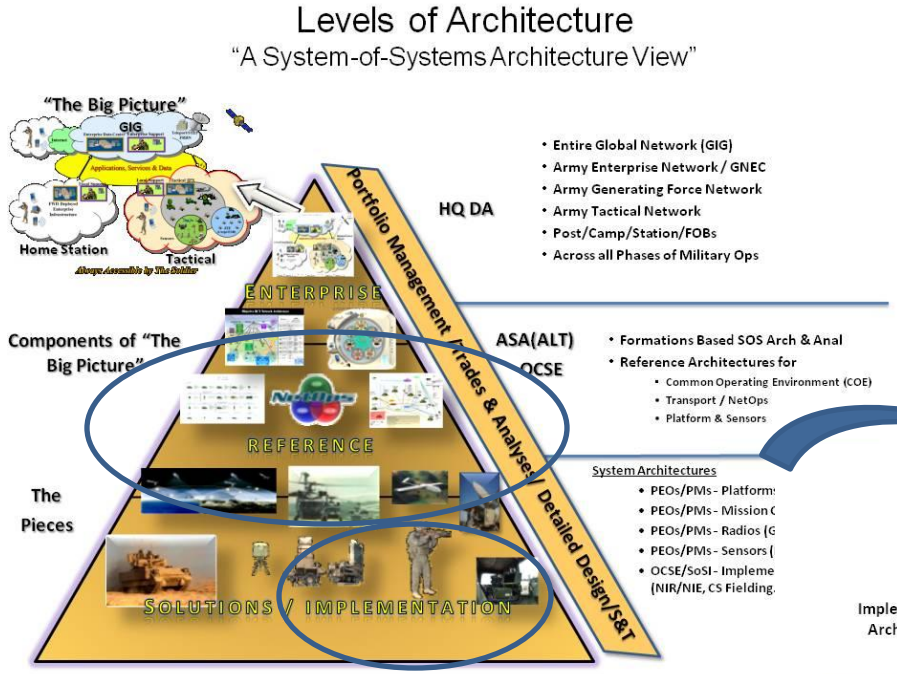
Common Operating Environment (COE)



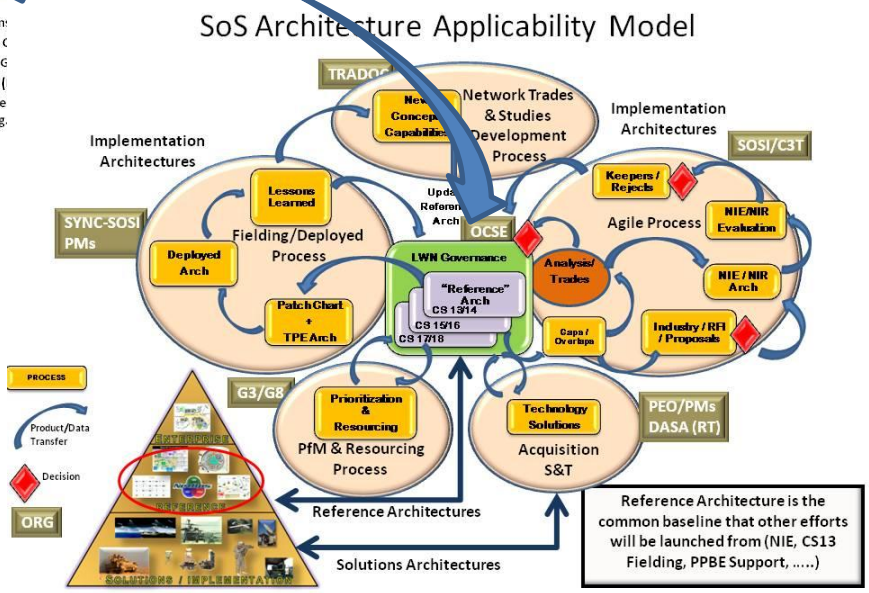
- COE Value Proposition
  - That if implemented across the Army it will greatly increase interoperability, agility, security, safety and operational relevancy and effectiveness and decrease time for development and delivery to the field, certification, and overall costs.
    - Increase Capability Agility
    - Reduce Life Cycle Costs through Standardized application and unity of effort
    - Flexibility infrastructure to evolve to rapidly emerging standards
    - Enhance cyber protection

Set of Computing technologies, standards, that will enable secure and interoperable applications to be developed rapidly and executed across a verity of computing platforms

Architectures & Analysis



ASA(ALT) reference & implementation architectures provide the foundation for system of system design, verification and fielding



SoS Systems Engineering & Integration

Threat vs. Capability Based Requirements

Army vs. Joint Requirement / SoS

Missions

Assessing performance to capabilities objectives

Recommend requirements for increment

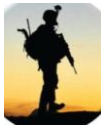
Identify candidate systems to support function

Assess options

Negotiate with systems

Develop plan

Synchronization & Governance ASA(ALT)



Assess SoS capabilities and limitations

Validate sets of systems

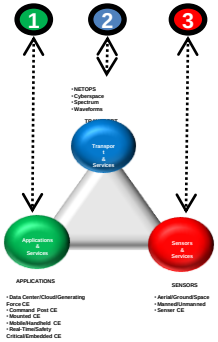
Verify sets of systems

Integrate sets of systems

SoS

Collaboration

Systems



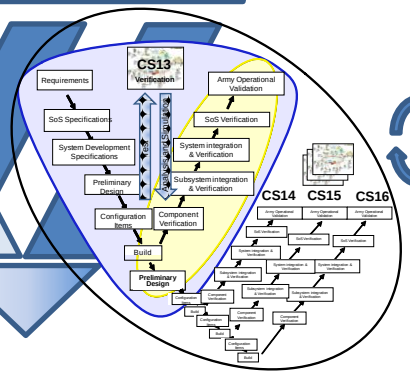
Network Components

Address requirements and solution options

Coordinate, monitor, and facilitate systems' development test and evaluation

Integration

Execution PEOs/PMs



Orchestrating upgrades to SoS

SOS Specifications:

Move from a virtual / collaborative SoS to an acknowledged / directed SoS

Acquisition and Engineering Support

Standardize Program and PEO Engineering Tier to support peer to peer reviews

- Identify Lessons Learned during each program review and consolidate the finding at the Army Materiel Systems Analysis Activity (AMSAA)
- Support key leadership engagement opportunities such as the Army System Acquisition Review Council, the Capabilities Portfolio Review, and associated Defense and Army Overarching Product Team reviews

Partnership with Research Development and Engineering Command (RDECOM)

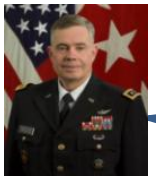
- Use the Systems Engineering Council to establish a standardized systems engineering model that consist of using SE subject matter experts in the areas of planning, engineering, architecting, analyzing, and reviewing system capabilities across the commands
- Conduct a market survey of innovative SE concepts, toolset, best practices, and collaborative forums will be used to improve the cycle time supporting PM milestone decision reviews

Require the use of available reference products and processes across the community

- Architecture and Analysis products to ensure the Programs and PEOs are aligned with Army initiatives such as COE, Joint Network Environment, Network Integration Events
- Center for Reliability Growth (CRG) use of Reliability Growth Curves, Reliability Score Cards, and participation in the Reliability Improvement Working Group

Improvements to Army Systems Engineering

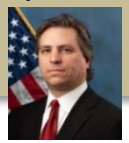
SYSTEMS ENGINEERING Research Center



ASA (ALT) MILDEP

Governance Board (RDECOM, OCSE, ASC)





Model and Policy	Education Opportunities	Development Assignments	Metrics
OCSE	ASC	OCSE	ASC
CP-16	RDECOM	DASA R&T	OCSE
ASC	DASA R&T	RDECOM	CP-16

Building the Bench

Using Specialty Engineering and Training (SE2T) Program, RDECOM Initiatives, Career Path 16, Rotational Assignments, NDIA SE forums

Conclusion

- Strong Systems Engineering is critical to program success
- Our development processes need to evolve to provide faster product cycles, more adaptable products and address emerging technical challenge
- Delivering timely SE artifacts is necessary to shape the SE & SoSE Environment
- Our program's success depends on a capable engineering workforce in and out of government

ASA(ALT) OSCE SharePoint Knowledge Center:
https://sp.kc.us.army.mil/sites/OCSE