National Defense Industrial Association Systems and Mission Engineering Conference

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Modular Open Systems Approach Implementation Guidebook

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Agenda

- Background
- Congressional Interest
- MOSA Vision
- Policy and Guidance… Where Is MOSA?
- Working Groups and Industry Engagements.. Bringing the Information Together
- MOSA Implementation Guidance
  - Why a Guidebook
  - Scope
  - Overview
- What's Next?

Background

Modular Open Systems Approach (MOSA) requirements are codified in law (e.g., 10 United States Code) for certain Department of Defense (DoD) programs

- All program managers can benefit from considering the requirements for modularity and open standards
  - DoD program sponsors and their associated Milestone Decision Authority (MDA) need consistent, quantitative, and repeatable measures to assess their program's compliance with statute
  - These measurements in turn will better enable them to continuously support DoD missions within a rapidly evolving battlespace

Congressional Interest in MOSA

- **2016:** OUSD(R&E) established MOSWG to address standards and architectures (FY15 NDAA Sec 801)
- **2017:** Congressional requirement for MOSA in Major Defense Acquisition Programs (MDAPs) (FY17 NDAA Sec 805)
- **2018**: MOSWG Tri-Service MOSA Tiger Teams spearheaded Service-specific guidance
- **2019:** Congressional direction to deliver MOSA Implementation guidance (FY20 NDAA Sec 805)
- **2020:** OUSD(R&E) MOSWG identified, ranked, prioritized DoD MOSA pain points, and established Tiger Teams
- **2021:** Congressional requirement for establish a MOSA-enabled interface repository to access interfaces and relevant documentation (FY21 NDAA Sec 804)

MOSA Vision

Ensure DoD architectures are modular and open to enhance competition, incorporate innovation, and support interoperability and rapid insertion of technology in DoD acquisitions

- Acquire systems that can be upgraded or modified to incorporate new technologies and respond to emerging threats
- Rely on architectures accessed from authoritative sources of truth that identify system components, component capabilities, the interfaces and standards used between components to identify upgradeable systems and reusable components.
- Identify standards which facilitate modularity and openness to enable consistent component replacement and interoperability
- Use relevant technology forecasts to field systems using tailorable modular and open system approaches for technology insertion that contribute to system success

Policy and Guidance… Where Is MOSA?

Office of the Secretary of Defense

Modular Open Systems Approach (MOSA) Reference Frameworks in Defense Acquisition Programs – May 2020

DoDI 5000.88 Engineering of Defense Systems – November 2020

Engineering of Defense Systems Guidebook – February 2022

Systems Engineering Guidebook – February 2022

United States Air Force

Air Force Data Rights Guidebook – July 2019

Air Force AFI-63-101/20-101 Integrated Life Cycle Management – June 2020

Air Force Material Command (AFMC) Guidebook for Implementing Modular Open Systems Approaches in Weapon Systems – September 2022

PEO Specific Guidance

Policy and Guidance… Where is MOSA?

United States Army

Modular Opens Systems Approach Implementation Guide, Office of the Chief Systems Engineer – June 2020

PEO Specific Guidance

- PEO IEW&S
- PEO GCS
- PEO AVN

United States Navy

Navy NAVSEA 9040.3A Acquisition and Management of Product Model and other Technical Data – March 2013

PEO-Specific Guidance

Working Groups and Industry Engagements.. Bringing It All Together

Modular Open Systems Working Group

MOSWG Pain Points

MOSWG developed a set of pain points with input from the industrial base and Military Department to address challenges in implementing MOSA in defense acquisition.

MOSWG Tiger Teams

MOSWG formed set of tiger teams to address each pain point and to develop deliverables that will support MOSA implementation in defense acquisition. Deliverables include a MOSA lexicon, recommendations to enable MOSA in acquisition, and an updated approach to assessing MOSA implementations.

Working Groups and Industry Engagements.. Bringing It All Together

Enabling MOSA

- Need addressed: Common method to describe MOSA in architectures
- Products: Architecture functional decomposition guidance for MOSA

Implementing MOSA

- Need addressed: Common examples and target architectures to aid modular and open system architecture
- Products: Supplemental reference architecture guidance for developing MOSA reference implementations

Contracting for MOSA

- Need addressed: Access to updated contracting requirements & processes for implementing MOSA
- Products: Contracting guidance and templates for implementing MOSA

Assessing MOSA

- Need addressed: Quantitatively evaluate of MOSA
- Products: Method and assessment criteria to quantitatively evaluate MOSA in designs, tech approach and business strategies

Working Groups and Industry Engagements.. Bringing it all Together

Defining MOSA

- Need addressed: Codify common definitions to guide MOSA design
- Products: Instructional Guidance with a taxonomy and lexicon for the use of MOSA in architectures

Access and Discovery of Standards to Enable MOSA

- Need addressed: Access to MOSA related standards and specifications
- Products: Solutions for identifying and accessing both government and industry standards that enable MOSA

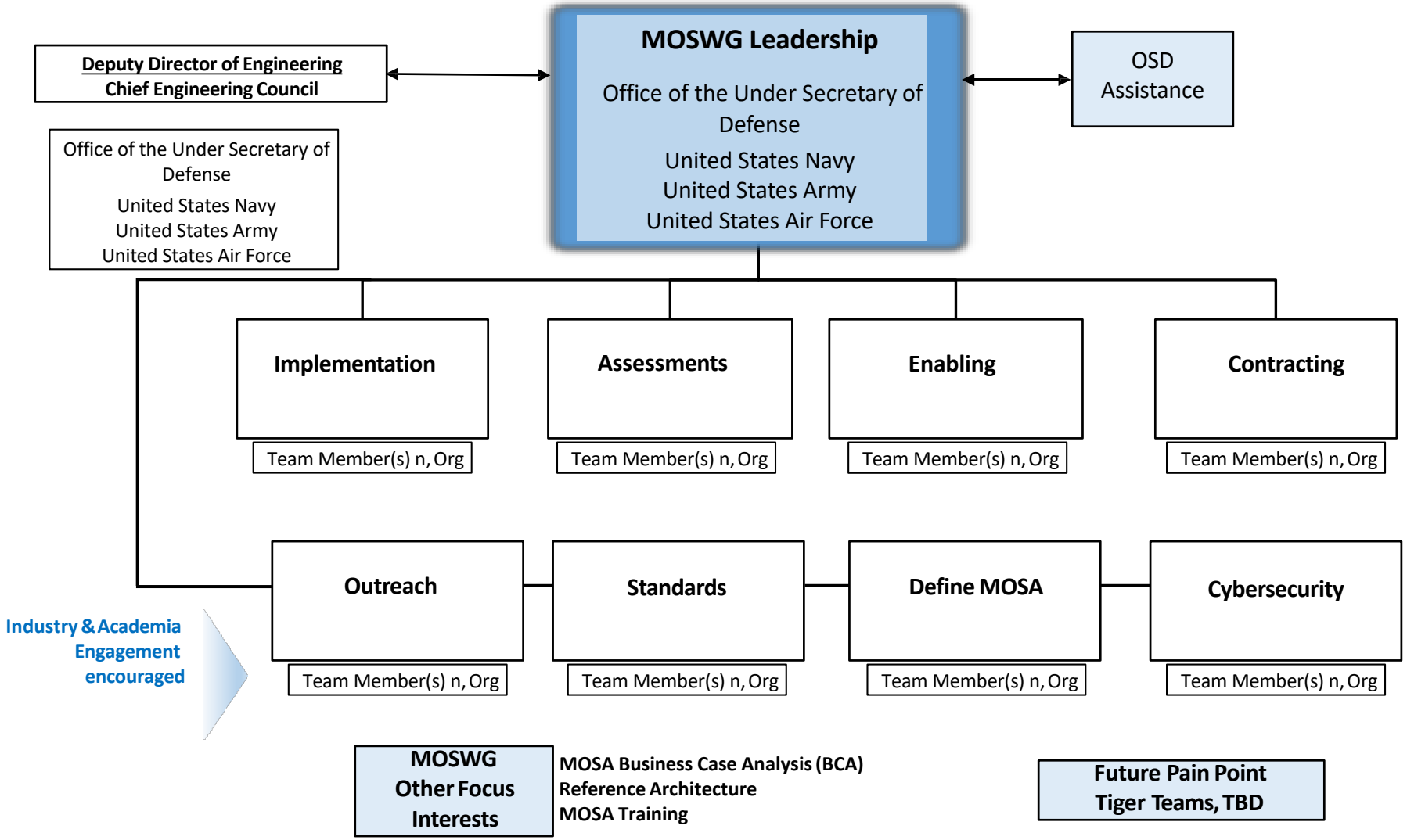
Training and the MOSA Community of Practice

- Need addressed: Advance the state of MOSA training and MOSA Community of Practice
- Products: Modernized MOSA Community of Practice site and updated MOSA CLE019

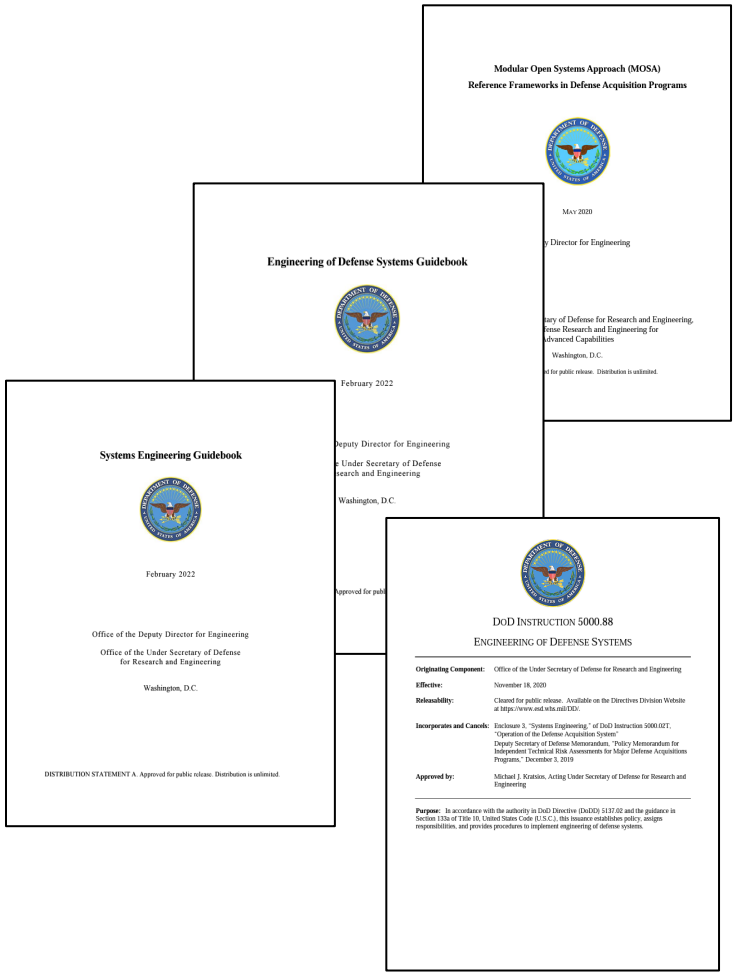
Community Outreach

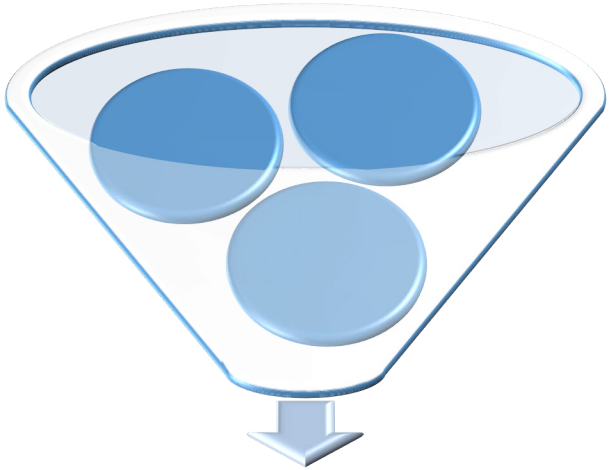
- Need addressed: Provide community of interest with regular MOSA-related updates
- Products: MOSA Newsletter and a curated MOSWG repository

Working Groups and Industry Engagements.. Bringing it all Together

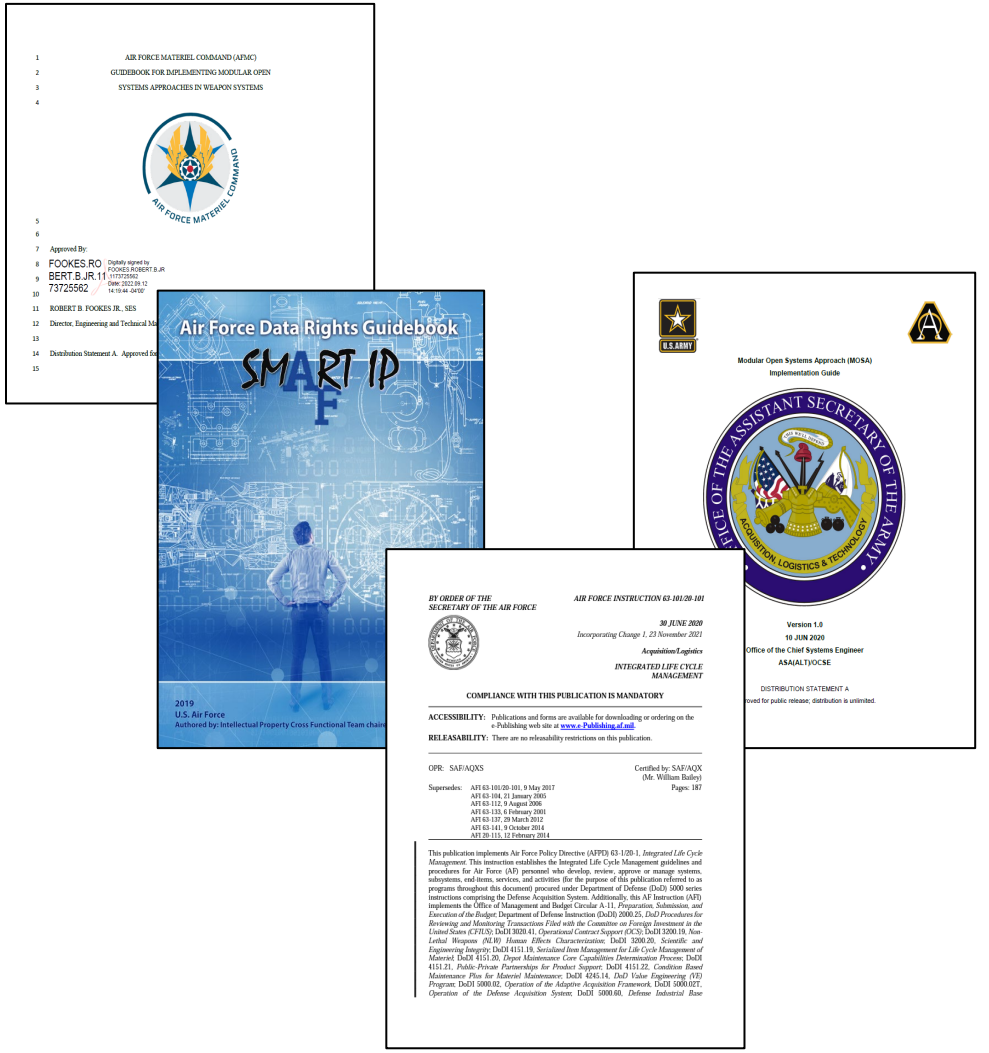


MOSA Implementation Guidebook
Why a Guidebook?

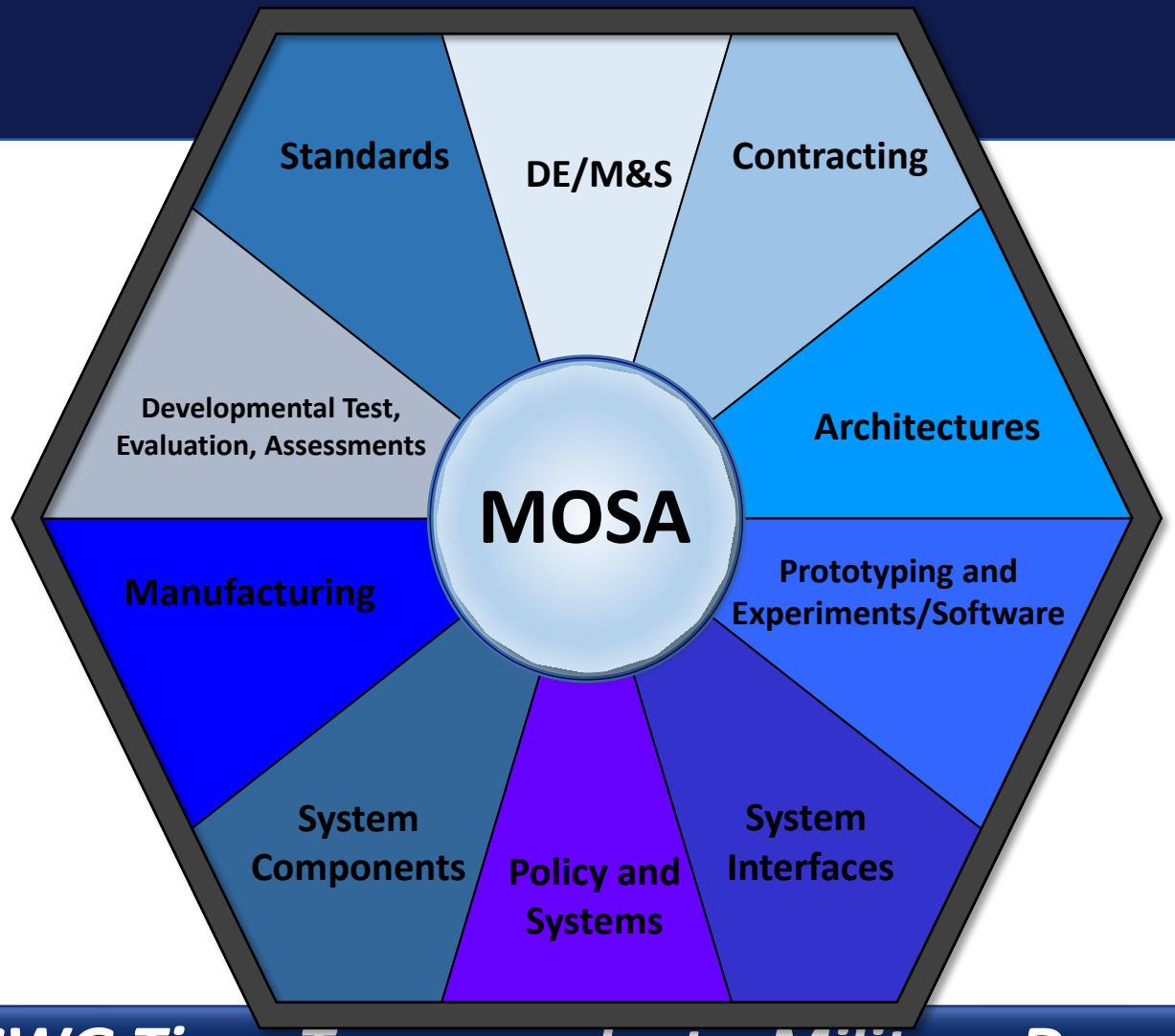




Synergistic guidance for MOSA Implementation



MOSA Implementation Guidebook Scope



Coalesce MOSWG Tiger Team products, Military Department MOSA exemplars and industry recommendations for MOSA implementation

MOSA Implementation Guidebook
Overview

MOSA Implementation Guidebook Timeline

- Phase 1 – June 2022
  - Kickoff meeting
  - Assigning writing sections of Implementation Guidebook
- Phase 2 – August 2022
  - Status meeting #1
  - Review of status of sections
- Phase 3 – September 2022
  - Status meeting #2
  - Submission of draft sections for consolidation and comment/review

MOSA Implementation Guidebook Timeline

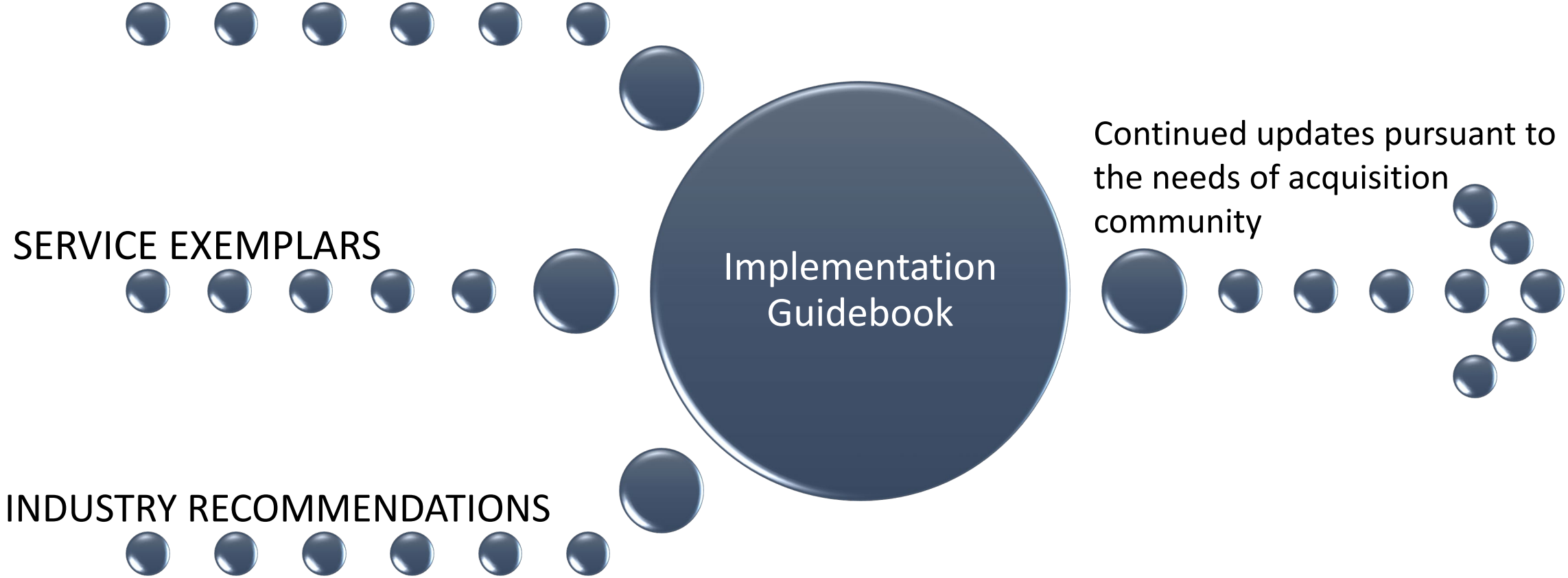
- Phase 4 – October/November 2022
  - Status meeting #3
  - Discussion/Adjudication of comments and edits
- Phase 5 – December 2022/January 2023
  - Status meeting #4
  - Discussion/Adjudication of comments and edits
- Phase 6 – December 2022/January 2023
  - Final submission of assigned guidebook sections
  - Technical Edit review
  - Public Affairs Submission
  - Release to https://cto.mil

What's Next?

OUSD(R&E) TIGER TEAM DELIVERABLES

SERVICE EXEMPLARS

INDUSTRY RECOMMENDATIONS



Continued updates pursuant to the needs of acquisition community

Collaboration Opportunities

- Bi-monthly MOSWG
  - Third Wednesday of every other month
  - https://intelshare.intelink.gov/sites/moswg/_layouts/15/start.aspx#/
- Monthly Tiger Teams
  - Implementing MOSA Tiger Team
  - Contracting for MOSA Tiger Team
  - MOSA Training/CoP Tiger Team
- DAU hosted Community of Practice
  - https://www.dau.edu/cop/mosa/Pages/Default.aspx
- SE Modernization Body of Knowledge – MOSA section (**forthcoming**)

Contact

Office of the Under Secretary of Defense for Research and Engineering

osd.r-e.comm@mail.mil | Attn: SE&A

https://www.cto.mil

https://ac.cto.mil/engineering

Backup

Defining MOSA Pain Point

- **Pain Point:** The DoD lacks a suite of references and common definitions for MOSA
- **The need exists** to codify common definitions to guide MOSA design
- **The need can be addressed** by developing a taxonomy and lexicon which can be adopted by the community
- **Intent:** Aid the consistent definition and description of MOSA in architectures
- **Products:** Instructional Guidance with a taxonomy and lexicon for the use of MOSA in architecture
- **Proposed MOSA Task:** Define MOSA by delivering a shared vocabulary

Defining MOSA
Products

Major Products

- Taxonomy and Lexicon for the use of MOSA in architecture
  - ✓Shared Vocabulary: Language, concepts, terminology to help with defining MOSA
- Instructional Guidance

Supporting Products

- List of things (items) that need to be common to enable MOSA
- List of commonly defined terms for MOSA
- Architecture requirements for using standards and interfaces to enable MOSA
- List of guidance for using standards and interfaces in architectures to enable MOSA

Enabling MOSA
Pain Point

- **Pain Point:** The DoD lacks processes and methods for describing MOSA
- **The need exists** to identify a methodology to describe MOSA in functional-level architectures
- **The need can be addressed** by providing the community architecture functional decomposition guidance for MOSA
- **Intent:** Aid the development of modular and open system architectures
- **Products:** Architecture Functional Decomposition Guidance for describing MOSA relationships and behavior at interfaces
- **Proposed MOSA Task:** Describe MOSA by delivering common descriptions and design patterns of MOSA architectures

Major Products

- Common design patterns
- Architecture requirements for using standards and interfaces to enable MOSA
- Functional-level architecture instructional guidance for describing and decomposing MOSA relationships and behavior at interfaces

Supporting Products

- List of “AS IS” architectures
- Functional-level architecture design patterns
- List of guidance to update

Implementing MOSA
Pain Point

- **Pain Point:** The DoD lacks a suite of references and common frameworks for MOSA
- **The need exists** to identify examples and target architectures to guide MOSA designs
- **The need can be addressed** by providing supplemental reference architecture guidance to guide MOSA designs
- **Intent:** Aid the development of modular and open system architectures
- **Products:** Instructional Guidance for defining MOSA reference implementations
- **Proposed MOSA Task:** Describe MOSA by delivering common reference examples and target architectures

Major Products and Supporting Products

Major Products

- MOSA Reference Implementations
- Domain Reference Architecture Framework Instructional Guidance
- Instructional Guidance for developing MOSA reference implementations (i.e., standard from which all other implementations and corresponding customizations are derived)

Supporting Products

- List of “AS IS” reference implementations enable MOSA
- List of guidance to update