



# PEO Reference Architecture Description Document (RADD) "Skinny"



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# RADD Executive Summary and Outline

The PEO Aviation Reference Architecture (RA) will guide and constrain the development of Army Aviation assets, systems, and components. This PEO Aviation Reference Architecture Description Document (RADD) is a readable description of the RA which is being developed and maintained within the Army Aviation Enterprise Architecture Framework (EAF) modeling environment. Concepts were derived from DoD “Reference Architecture Description” document, dated June 2010.

Section	Subsection
1.0 Introduction	<ul style="list-style-type: none"> <li>1.1 Strategic Purpose</li> <li>1.2 Background</li> <li>1.3 Approach</li> <li>1.4 Stakeholders</li> </ul>
2.0 Document Structure	<ul style="list-style-type: none"> <li>2.1 Relationship to Modeling Environment</li> <li>2.2 Architectural Model Management</li> </ul>
3.0 Principles	<ul style="list-style-type: none"> <li>3.1 Architecture Context</li> <li>3.2 Requirements Traceability</li> </ul>
4.0 Open System Architecture Strategy	<ul style="list-style-type: none"> <li>4.1 Existing Standards – Technical Positions</li> <li>4.2 PEO Reference Architecture Key Interfaces</li> <li>4.3 Enduring Fleet Open Systems Architecture Strategy</li> </ul>
5.0 Major System Components (MSCs)	<ul style="list-style-type: none"> <li>5.1 MSC Priorities</li> <li>5.2 MSC Descriptions</li> <li>5.3 Key Interfaces</li> </ul>





# Introduction

## • Strategic Purpose

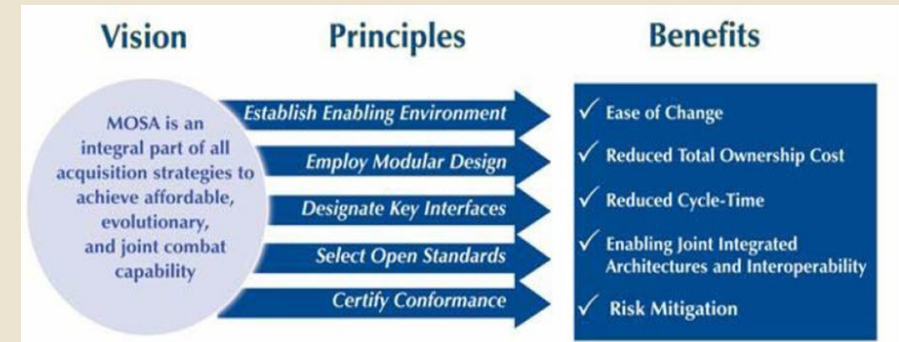
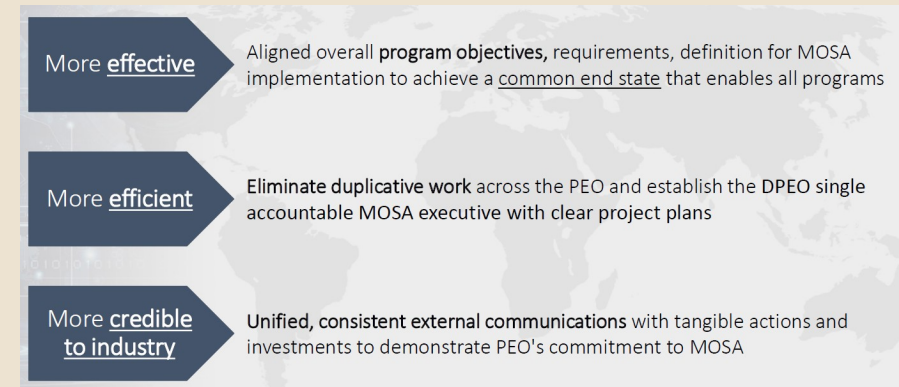
- Guide and constrain the development of Army Aviation Systems
- Define boundaries to promote reuse across platforms
- Inform ongoing development, maintenance, and operations across the fleet in an operational environment

## • MOSA Objectives

- Improved Lifecycle Affordability
- Increased Readiness
- Enhanced Capabilities
- Reduced Schedule Pressure
- Reduced Supply Chain Risk

## • Approach

- Establish a comprehensive Enterprise Architecture Framework
  - Functional decomposition traceable back to common capabilities
  - All Major System Components identified to inform Key Interfaces
  - Key Interfaces used to determine Open Standards
  - Governance to constrain future implementations to avoid duplication of efforts





## Stakeholders

- Congress
- Operational Users
- Requirements Authorities
- ASA (ALT)
- Program Executive Office
- Airworthiness Authorities
- Program Offices
- Army Lab Facilities and Staff
- Original Equipment Manufacturers
- Major Mission System Integrators
- Component Suppliers



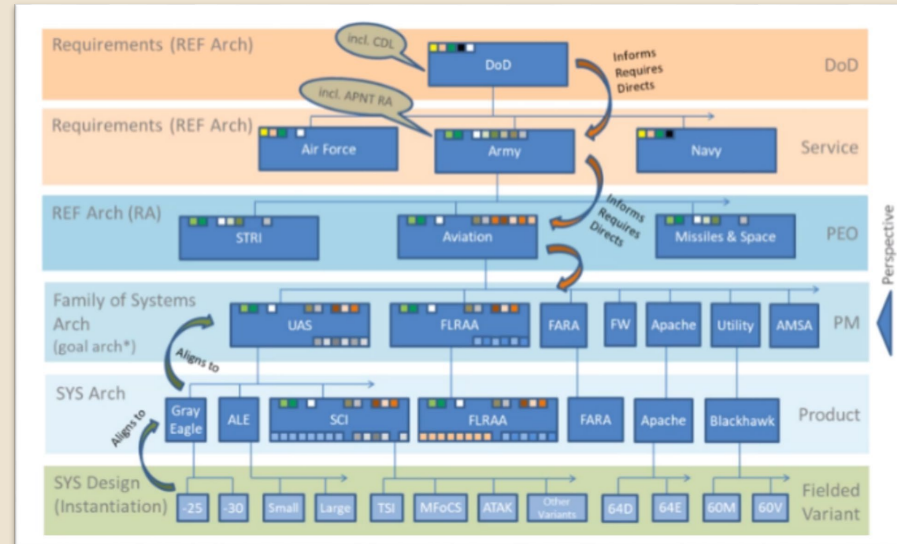
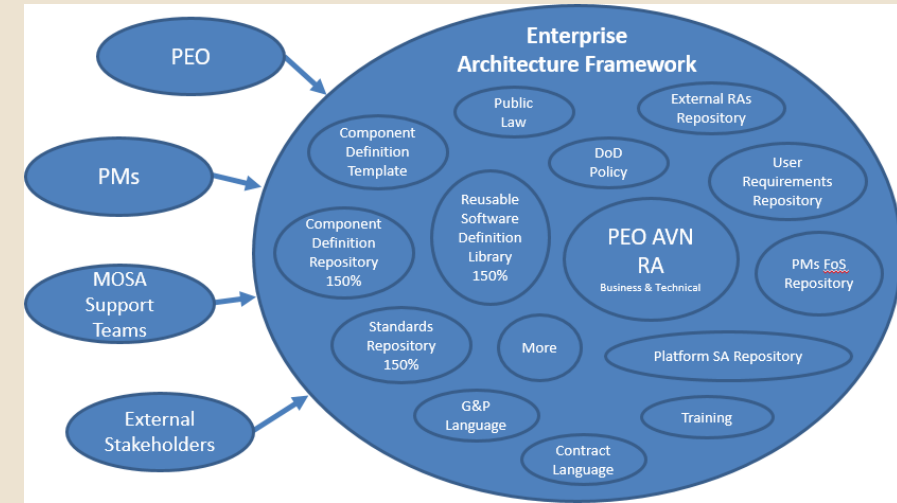
# Modeling and Architectures

## Modeling

- Collaborative Digital Environment managed by PEO Aviation
- Architectural Model Management
  - Model-based content aligned to MBSE
  - Library of common resources
  - Communication of key concepts, requirements, and resources
  - Consistency of architecture development

## Architectures

- Reference Architecture Relationships
- Architecture Levels
- Requirements Traceability



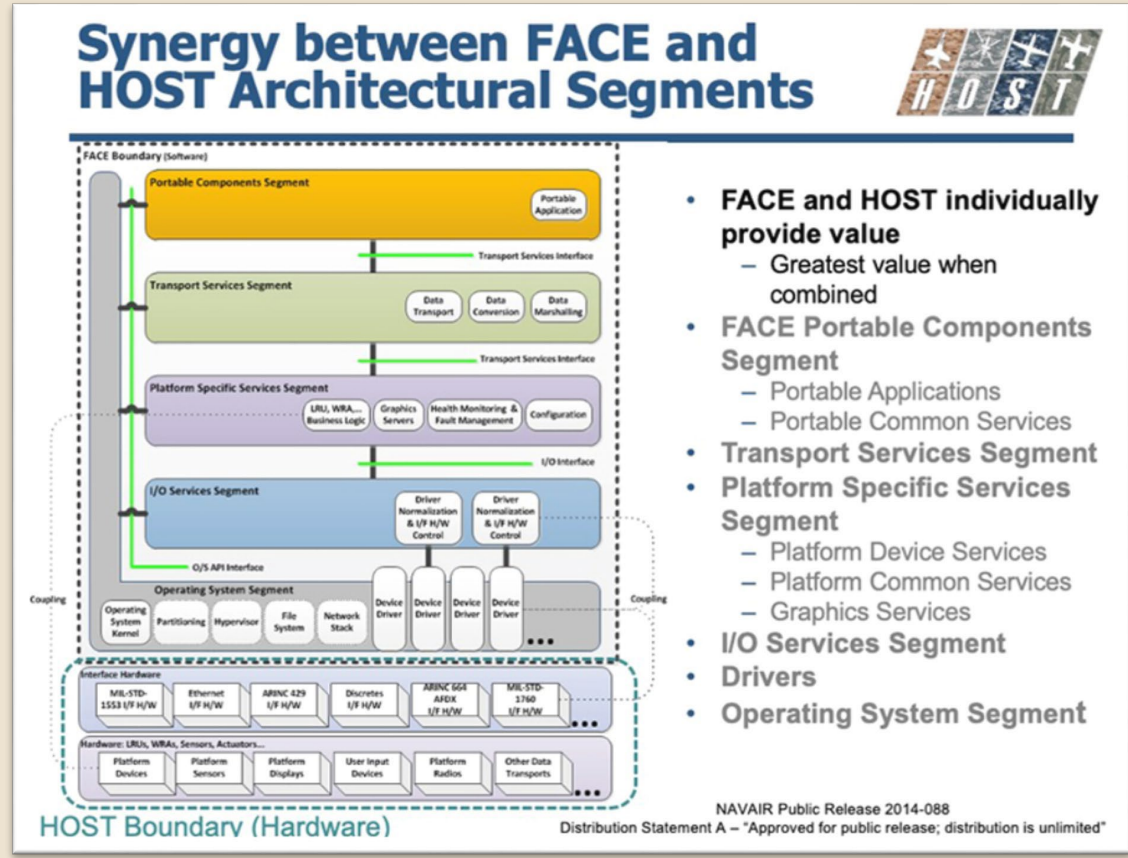




# Open System Architecture Strategy

- FACE and HOST serve as the foundational open system standards that will apply across the Army Aviation Enterprise portfolio of systems
- Additional interface standards will be prescribed based on Key Interfaces as developed through the ACWG and modeled in the EAF

- Architectural elements with corresponding relevant standards are shown in the above table



Architectural Element	Architecture Pattern Mechanisms
<b>Hardware</b>	<ul style="list-style-type: none"> <li>• HOST [Foundational Standard]</li> <li>• CMOSS Umbrella of Applicable Standards               <ul style="list-style-type: none"> <li>○ OMS</li> <li>○ VICTORY</li> <li>○ SOSA</li> </ul> </li> <li>• Physical Data Bus Interfaces</li> </ul>
<b>Software</b>	<ul style="list-style-type: none"> <li>• FACE [Foundational Standard]</li> <li>• ARINC 661</li> <li>• ARINC 653</li> <li>• CMOSS</li> </ul>
<b>Data Description</b>	<ul style="list-style-type: none"> <li>• FACE DSDM (Enterprise level DSDM)</li> </ul>
<b>Function</b>	<ul style="list-style-type: none"> <li>• AV/MSA function</li> <li>• JCA</li> <li>• JCSFL</li> </ul>
<b>Digital Backbone</b>	<ul style="list-style-type: none"> <li>• Physical Networking Standards</li> <li>• Messaging Standards</li> <li>• Interoperability</li> </ul>
<b>Key and Critical Interfaces</b>	<ul style="list-style-type: none"> <li>• As defined in the EAF</li> </ul>
<b>Model Construction/Content Representation</b>	<ul style="list-style-type: none"> <li>• EAF Model Element Guide</li> <li>• EAF Pattern Descriptions</li> <li>• Architecture Requirements</li> </ul>



# Major System Components (MSCs)

- An MSC is a high-level subsystem or assembly, including hardware, software, or an integrated assembly of both that can be mounted or installed on an MSP (Major System Platform) through well-defined interfaces (i.e., Key Interfaces, Major System Interfaces). Additional interface standards will be prescribed based on Key Interfaces as developed through the ACWG and modeled in the EAF.
- The MSCs identified within this document serve as the initial PEO AVN Enterprise prioritization for MSCs common to multiple enduring and future platforms.

MSC	Description
Aviation Mission Computing Environment (AMCE)	Configurable processing environment supporting open graphics, transport services, software loading, decoupling from board support with means to produce display symbology and Common Operating Picture information
Link 16	Solution that enables host aircraft to join the tactical Link 16 network
Airborne Radio Control Manager (ARCM)	Common voice and digital communications
Navigation	Integrated implementation supporting TACAN, VOR/ILS, EGI, IFF, and ADS-B
Aircraft Survivability Equipment (ASE)	Common A-Kit and ASE subsystem architecture applicable across Army Aviation programs
Dynamic Airspace and Mission Planning Environment (DAMPE)	Combination of legacy AMPS and TAIS functionality
Mission Planning Data Loader	Common capability to load mission planning information applicable across Army Aviation programs
Common Pilot Vehicle Interface (PVI)	Common “look and feel” implemented to ARINC-661 requirements
Degraded Visual Environment (DVE)	Architecture consisting of sensors and software supporting operations in DVE
Power Distribution	Solution that employs Electronic Circuit Breakers and handles power management, generators, conversion electronics, batteries, and supplemental power units
Unmanned Vehicle Control	Controls to command Air Launched Effects and other Army Unmanned Air Systems



# Key Interfaces Under Consideration

- Key interfaces are defined at different levels of abstraction and implementation. Interfaces can be defined as architecture patterns.
- Key interfaces are compositional in nature. An implementation may realize multiple interfaces. From a definition perspective, it may be adequate to specify only a part of an interface as a key interface.
- Key interfaces are applied to a specific platform or component development as requirements.
- As part of the key interface determination, requirements are created that describe the key interface and are levied on a platform or components.

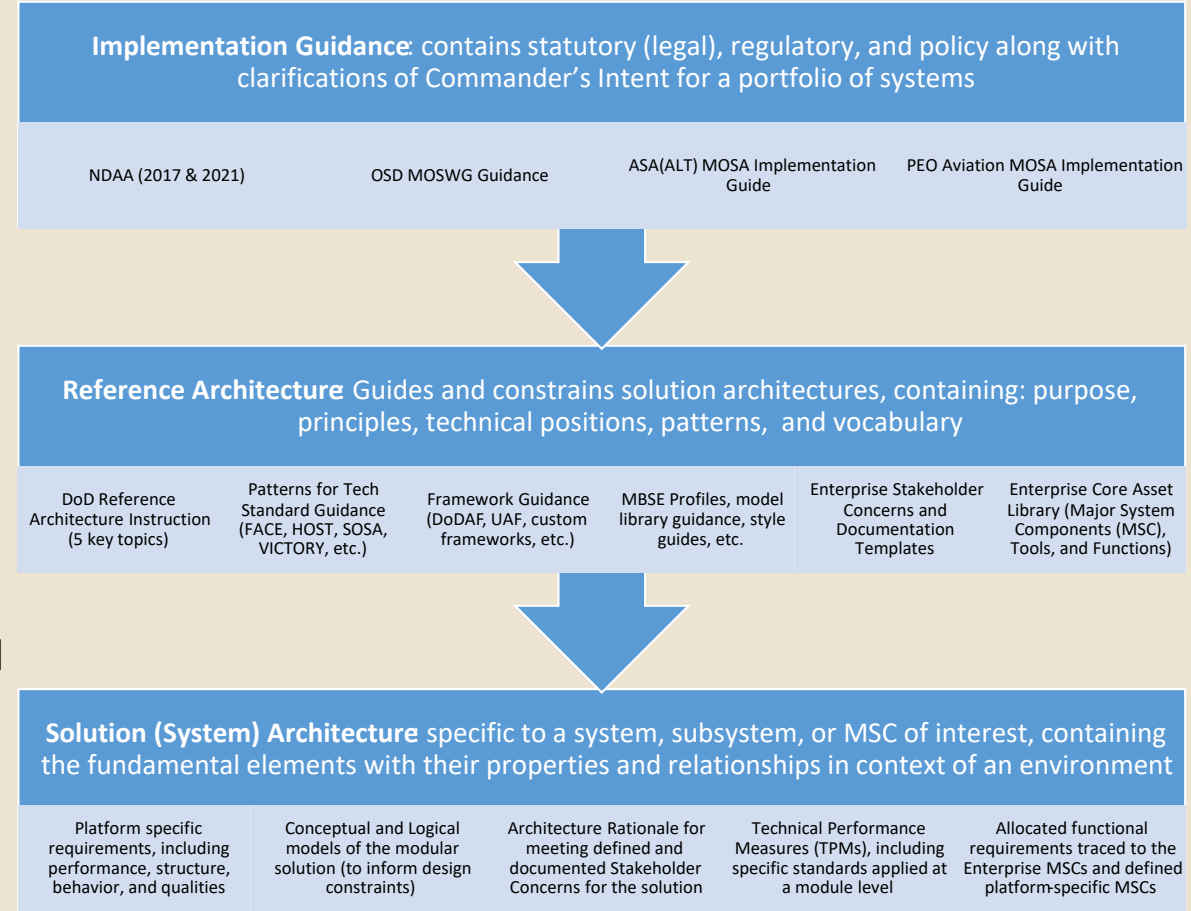
Aircraft Systems Monitoring Service Interface	Mission Data Management Service Interface	System Time Service Interface	Wireless Communications Interface	Flight Data Recording Interface
Event Audit Service Interface	Navigation Data Management Service Interface	Tactical Data Link : ARC-220	Aerial Refueling Interface	GeoInt Targeting
Blue Force Tracker Interface	Network & Transport Protocols	Tactical Data Link : BFT	Air-Ground Radio Communication	Hazard Information Service Interface
Data Logging Service Interface	Network Configuration & Discovery	Tactical Data Link : Global Information Grid connection	Architectural Interfaces	Imagery
Dataload Interface Analysis Context	Network QoS	Tactical Data Link : LINK16	Areas Of Interest Service Interface	Map Data Management Service Interface
Digital Signature Service Interface	Network Route Management	Tactical Data Link : MUOS	Audio	Motion Imagery
Encryption Decryption Service Interface	Operational Mode Management Service Interface	Tactical Data Link : SATURN	Charts & Maps	Navaid Tuning
External Power Interface	Position Data Service Interface	Tactical Data Link : SINCGARS	Civil Datalink	Obstacle Information Service Interface
Fuel Port Interface	Power Control Interface	Terrain Data Management Service Interface	Civil Surveillance	Platform Configuration Data Service Interface
Graphical User Interface Services	Satellite Navigation Interface Analysis Context	UAS Control System Interface	Common Operating Picture Service Interface	Platform Performance Data Service Interface
Identify Friend or Foe	Stores Interface	User (Physical/Cognitive) Interface Analysis Context	Data Storage Service Interface	Stores Management Service
Internal Power Interface	System Capability Registry Service Interface	User Authentication Service Interface	Elements Of Interest Service Interface	Threat Information Service Interface
Key Management Service Interface	System Health Management Service Interface	Voice over IP communication	Elevation & Obstacle Data	Track Management Service Interface





# RADD Path Forward

- Will be the result of Reference Architecture (RA) model-based content
- Serves as authoritative source of information that will guide and constrain the development of PEO AVN “solution” (i.e. System) architectures by providing:
  - Strategic Purpose (Authoritative Source)
  - Principles (Fundamental Statements)
  - Technical Positions (Policy, Standards, Reuse Library)
  - Patterns (Proven solutions to common problems)
  - Vocabulary (Semantic classification and meaning of Terms and Definitions)
- Will contain multiple RA’s that are subject area specific (i.e. Army’s APNT RA) that provide a focused or a different emphasis





# Closing Comments and Questions



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AMSAs



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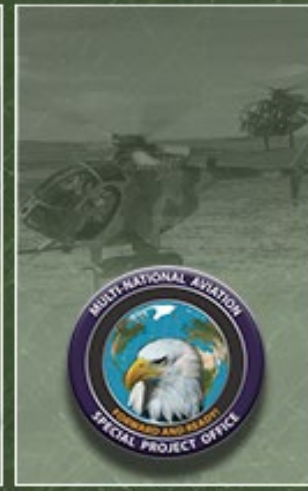
FARA



FLRAA



FW



MASPO



UAS



UH