Open Systems Standards and Agile Acquisition

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Congressional Emphasis

- **Section 804 of 2016 NDAA authorizes a Middle Tier acquisition pathway for rapid prototyping and fielding**
  - **DON and USAF have distributed guidance**
- **Section 805 of 2017 NDAA describes requirement for Modular Open Systems Approach (MOSA) in major defense acquisition programs**
  - **Modular design**
  - **Major System Interfaces conform to widely supported & consensus based standards**
  - **System architecture that provides for severable components**

NDAA MOSA Goals

- **Significant cost avoidance**
- **Schedule reduction (speed of capability to the field)**
- **Opportunities for rapid technical upgrades**
- **Increased interoperability**

Challenges

- **Numerous issues need to be addressed to achieve the vision**
  - **What architectures do you start with?**
  - **What open standards are emerging?**
  - **How do you streamline testing or manage just-in-time testing?**
  - **How do you streamline the accreditation process?**
  - **Will there be component libraries available to draw from?**
  - **How do you streamline the requirements process?**

Trends – Emerging Standards

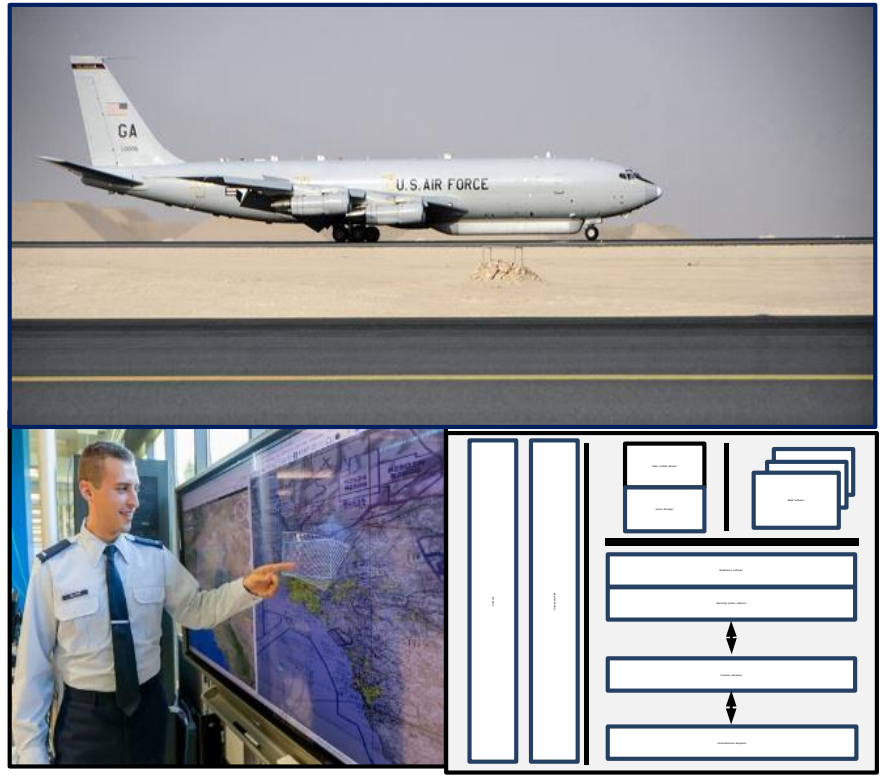
- C4ISR/EW Modular Open Suite of Standards (CMOSS)
- Common Open Architecture Radar Programs (COARPs)
- Future Airborne Capability Environment (FACE)
- Hardware Open Systems Technologies (HOST)
- Modular Active Protection System (MAPS)
- Modular Open Radio Frequency Architecture (MORA)
- Open Mission Systems (OMS)
- Sensor Open Systems Architecture (SOSA)
- Simulator Common Architecture Requirements and Standards (SCARS)
- Software Communications Architecture (SCA)
- STANdardization AGreements (STANAGs - various standards)
- Universal Armament Interface (UAI)
- Universal Command and Control Interface (UCI)
- Unmanned Systems (UxS) Control Segment (UCS)
- Vehicular Integration for C4ISR/EW Interoperability (VICTORY)

Trends – GRAs

- **Government Reference Architectures appear to be an approach to address some of these challenges**
  - **Provides a starting place**
  - **Includes appropriate standards**
  - **Aids testing due to familiarity and incremental approach**
  - **Same with accreditation**
  - **Libraries still need to be addressed**
  - **Requirements process still needs to be addressed**

JSTARS Recap Example

- **GRA developed through interaction with Industry SMEs**
  - Non-proprietary interfaces and open standards
  - Open Mission Systems (OMS) standard
  - Common Open Architecture Radar Programs (COARPs) standard
  - Safety of flight isolation

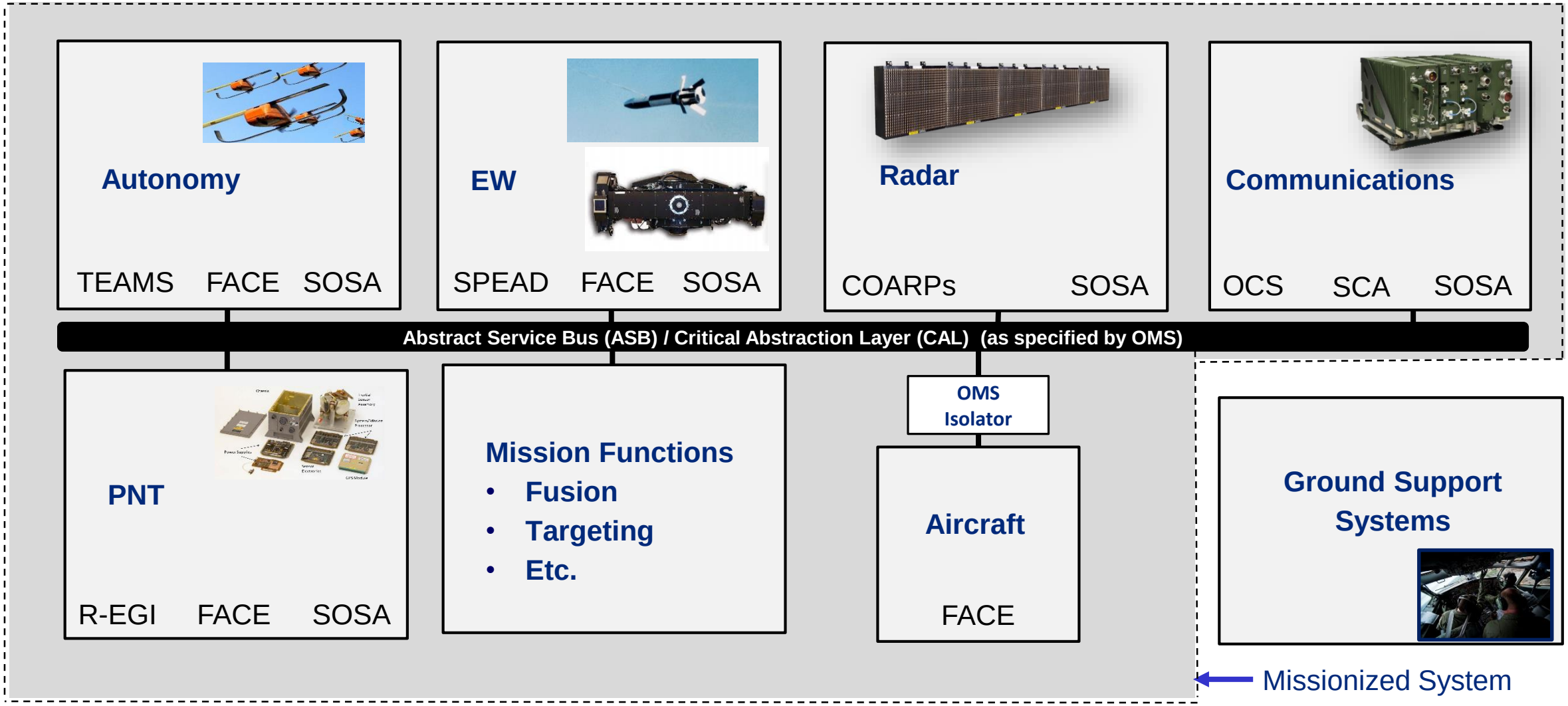


GRA Benefits

- **Formally represents Government's understanding of weapon system requirements**
- **Modeled using modern architectural tools**
- **Helps Government understand program trade space**
- **Facilitates discussions during all phases**
- **Readily useable as the starting point for future efforts**

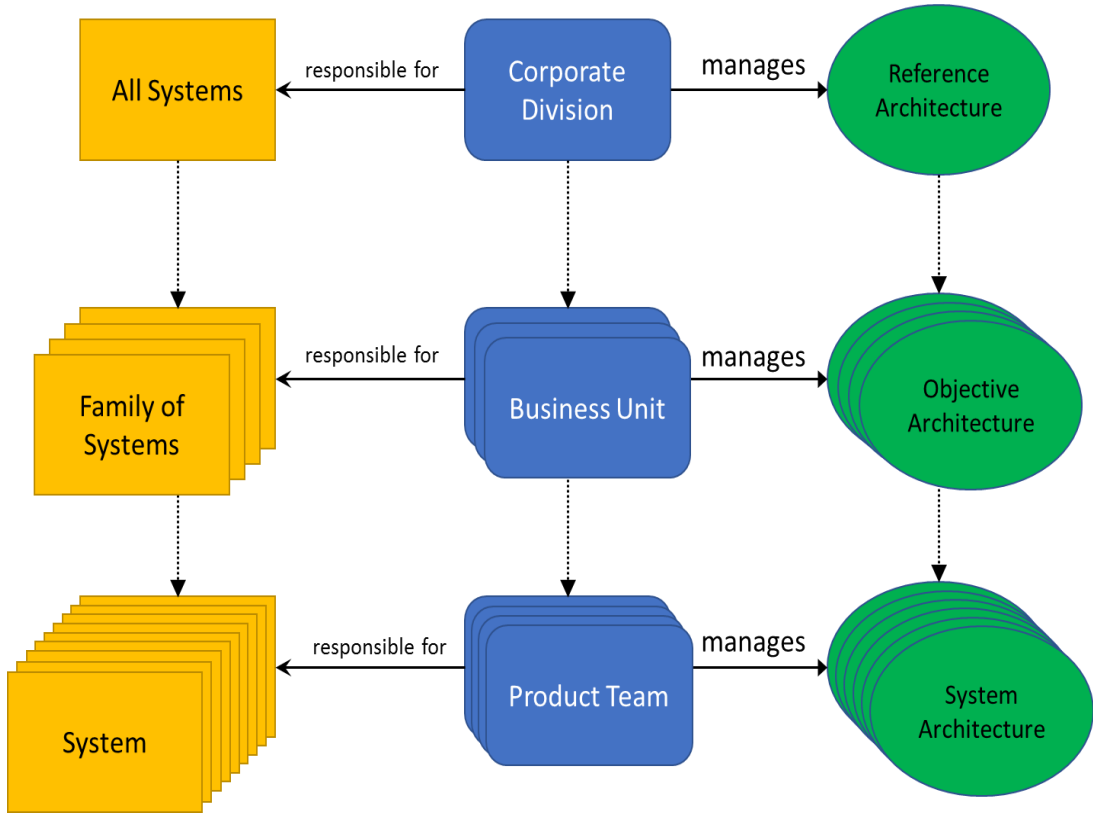
Notional Avionics GRA

AFLCMC… Providing the Warfighter's Edge



MOSA Methodology

- **Joint Multi-Role (JMR) Comprehensive Architecture Strategy (JCAS) is an evolving Government-led architectural approach that blends open systems enablers with an overarching enterprise approach in order to influence desired lifecycle characteristics of procured systems in a coordinated manner reflecting a Family of Systems (FoS) approach**
  - **Based on three, traceable levels** (at varying levels of organizational control) of architectural specificity, analysis, and documentation to achieve desired technical and business drivers established at each level
  - **Integrates business and technical objectives** with the intent of creating severable and compete-able modules that allows vendor-independent acquisition and intentional creation of reusable components
  - **Enables controlled elaboration and provides traceability** between the outcome of decisions (choices), and the business drivers behind the choices.
  - **Promotes architectural consistency** to enable flexibility and innovation in order to reduce the likelihood that a platform will develop unique and difficult to support solutions from an enterprise perspective through the right blending of approaches capable of meeting desired high level or operational goals.



Conclusions (Questions)

- **Is it possible to kick-start future programs or modifications by supplying a government reference architecture?**
  - **If so, can we add "basic" or foundational cyber controls?**