

Report: Concepts and Implementations Behind Modular Open System Arc

Generated on May 03, 2025

I. Core MOSA Principles

Modular Open Systems Architecture (MOSA) is a Department of Defense (DoD) strategy aimed at ensuring systems are modular, interoperable, and support rapid technological advancement through open interfaces and component separation.

II. Key Concepts from the AFMC MOSA Guidebook

1. Modular Decomposition:

- Breaking systems into discrete, testable components (logical, functional, physical).

2. Key Interfaces:

- Interfaces critical to mission success; must be documented and use open standards.

3. MOSA Interfaces:

- Must be machine-readable, standards-compliant, and explicitly documented.

4. Interface Repository:

- Maintains all interface syntax, semantics, and standard mappings.

5. Use of Standards:

- Encouraged standards include OMS/UCI, FACE, SOSA, UAI, VICTORY.

6. Lifecycle Integration:

- MOSA should be part of Acquisition Strategy, RFPs, Reviews, and Sustainment planning.

III. Core Software Implementation Concepts in Provided Code Files

A. Component Separation and Encapsulation:

- Distinct .cpp/.h files for sensor, network, and interface logic.

B. Defined External Interfaces:

- JSON-over-HTTP interface using standardized MIME types.

C. Dual Output Strategy:

- Macros mirror data to Serial and LCD displays.

D. Header and Source Pairing:

- Promotes interface clarity and internal logic encapsulation.

E. External Configurations:

- Use of a secrets header to isolate environment-sensitive data.

F. Interoperable Data Formats:

- Remote data consumer (Python GUI) expects JSON, demonstrating protocol compliance.

IV. Testing and Interface Verification Concepts

- Interfaces provide structured outputs and support real-time querying and verification.
- Emphasizes principles of modularity, conformance, and functional testability.

Conclusion: The system design shown in the files models MOSA principles in structure and logic, with clear interfaces, modular components, and standards-ready implementation paths.