

Alphabet Soup of the DoD's Hardware Convergence: A Glossary of Relevant Acronyms



Alphabet Soup

of the DoD's Hardware Convergence:

Over many years, the service branches of the Department of Defense and intelligence agencies have used open architectures developed with industry standards organizations for some systems. Each had a goal of developing a set of open standards that would streamline development and deployment of defense electronic equipment to aid and protect the warfighter. In recent years, said agencies began actively working side-by-side with industry partners to support the development of a network of systems, hardware and software components designed for interoperability using these common sets of standards, architectures and technologies. In a [memo dated January 7, 2019](#), the offices of the U.S. Army, Navy and Air Force jointly stated their commitment to include, in all future requirements, systems designed using open standards, generally

referred to as the Modular Open Systems Approach, or MOSA. It specifically refers to Future Airborne Capability Environment (FACE), Sensor Open Systems Architecture (SOSA), and Vehicular Integration for C4ISR/EW Interoperability (VICTORY).

Elma has been involved in open standards since the early days of open architectures like VME and CPCI. We are a major contributor to the emerging SOSA standard as well as VITA 65, on which SOSA is largely based.

The list of acronyms on the following pages was developed to give those who are new to the industry, as well as seasoned professionals needing to understand this landscape, a means of understanding much of the terminology used throughout the Tri-Service Initiative conversation.

What is the Sensors Open Systems Architecture (SOSA™)?

At the heart of this initiative are several standards that support different aspects of open architecture design. SOSA primarily addresses the system hardware elements. See a longer description in the glossary below.

How will the industry benefit?

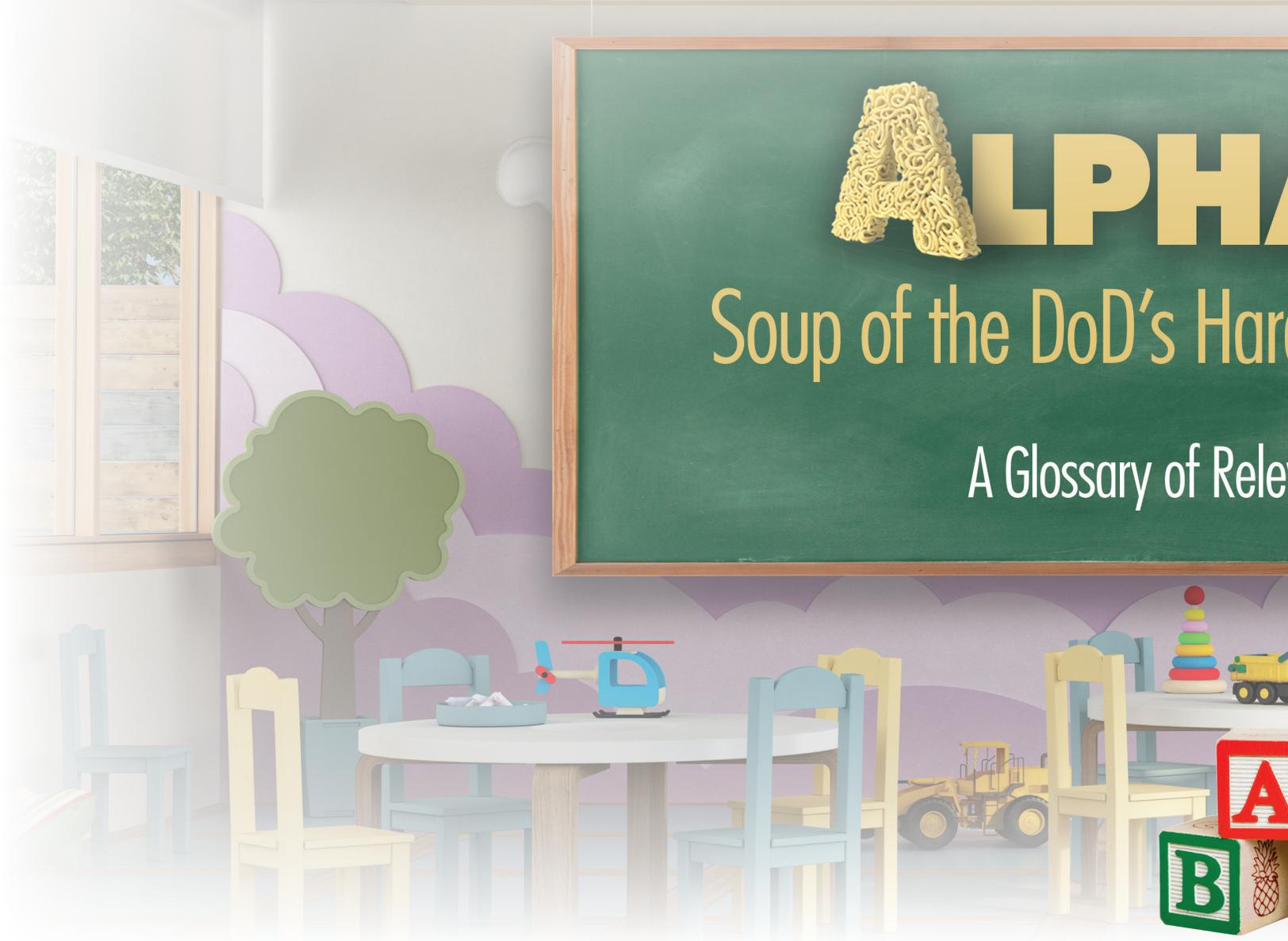
Interoperability and collaboration among vendors, developers and the DoD itself will bring a host of time saving, cost reducing benefits as well as help foster best-in-class military systems for modern warfare:

- Mitigate technology obsolescence: with everyone working on the same platform, technologies won't become outdated or isolated as often.
- Encourage collaboration: as the ecosystem develops, vendors and customers will be able to better share ideas that can lead to new ways of thinking and foster the development environment.
- Shorten time to market: since 'reinventing the wheel' becomes a thing of the past, companies can move products to market quicker, building on standardized technologies and proven, in-use solutions.
- Reduce development costs: the time to create a new innovation from the ground up will be minimized as system manufacturers access interoperable components that already integrate and communicate with one another.

ACRONYMS FOR ORGANIZATIONS

Acronym	Stands for	Definition
AFLCMC	Air Force Life Cycle Management Center	Provides holistic management of weapon systems across their life cycle and simplifies/consolidates staff functions and processes to curtail redundancy and enhance efficiency. AFLCMC's operating structure provides an integrated framework for decision making and process optimization across the weapon system life cycle.
ANSI	American National Standards Institute	Large association that enhances the global competitiveness of U.S. business and quality of life by providing a framework for fair standards development and quality conformity assessment systems and safeguarding their integrity.
ARINC	Aeronautical Radio, Inc.	Used in relation to ARINC 429, the basic description of the functions and the supporting physical and electrical interfaces for the digital information transfer system
AFRL	Air Force Research Laboratory	AFRL leads the discovery, development and delivery of warfighting technologies for our air, space and cyberspace forces. We're pushing the boundaries and creating a new tomorrow through unparalleled research.
CC DC	U.S. Army Combat Capabilities Development Command	The U.S. Army Combat Capabilities Development Command was formed in 2019 and combined branches formerly known as CERDEC + RDECOM into one entity. Its mission is to provide the research, engineering, and analytical expertise to deliver capabilities that enable the Army to deter and, when necessary, decisively defeat any adversary now and in the future. Its vision is to be the scientific and technological foundation of the Army Modernization Enterprise through world-leading research, development, engineering and analysis.
CERDEC	Communications-Electronics Research, Development and Engineering Center	Division of US Army that discovers, develops, and rapidly delivers innovative technologies sound engineering solutions to provide networked warfighters and soldiers with information dominance and decisive lethality through integrated C5ISR systems.
DoD	Department of Defense	The US government organization that encompasses all branches of military service units, including the Army, Navy, Air Force, who are driving the SOSA initiative.
FACE	Future Airborne Capability Environment Consortium	The FACE™ Consortium is a government industry software standard and business strategy for acquisition of affordable software systems that promotes innovation and rapid integration of portable capabilities across global defense programs – Naval Air Systems Command and Army Aviation Command, NSA (low visibility)

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JTNC	Joint Tactical Networking Center	Supports the DoD's goal of rapid identification, characterization, procurement, fielding and sustainment of modular, innovative tactical communications products that ensure secure, interoperable, and resilient C4ISR capabilities by operating a cyber-hardened DoD-wide Information Repository (IR) that provides software code and relevant documentation for reuse based on legal agreements between government and software developers.

ACRONYMS FOR ORGANIZATIONS

ALPHABET

Hardware Convergence:

Relevant Acronyms



Acronym	Stands for	Definition
NAVAIR	Naval Air Systems Command	Established in 1966, provides full lifecycle support of naval aviation aircraft, weapons and systems operated by sailors and marines, including research, design, development and systems engineering; acquisition; test and evaluation; training facilities and equipment; repair and modification; and in-service engineering and logistics support.
OASIS	Organization for the Advancement of Structured Information Standards	An industry organization committed to advancing work throughout a broad set of technologies, including cybersecurity, blockchain, privacy, cryptography, cloud computing, IoT, urban mobility, emergency management and content technologies, to lower cost, improve efficiency, stimulate innovation, grow global markets and promote interoperability. Some widely adopted OASIS standards include AMQP, CAP, CMIS, DITA, DocBook, KMIP, MQTT, OpenC2, OpenDocument, PKCS, SAML, STIX, TAXII, TOSCA, UBL, and XLIFF.

ACRONYMS FOR TECHNOLOGIES & PROCESSES

Acronym	Stands for	Definition
OMG	Object Management Group	An international, open membership, not-for-profit technology standards consortium driven by vendors, end-users, academic institutions and government agencies. OMG Task Forces develop enterprise integration standards for a wide range of technologies and an even wider range of industries. OMG's Well-known modeling standards include the Unified Modeling Language (UML) and Model Driven Architecture (MDA), that enable powerful visual design, execution and maintenance of software and other processes.
OMS	Open Mission Systems	Aims to develop industry consensus for a non-proprietary mission system architectural standard that enables affordable technical refresh and insertion, simplified mission systems integration, service reuse and interoperability, and competition across the lifecycle
RDECOM	United States Army Research, Development and Engineering Command	RDECOM is a subordinate command of the U.S. Army Futures Command, now under the Combat Capabilities Development Command (CCDC) along with CERDEC. RDECOM was tasked with "creating, integrating, and delivering technology-enabled solutions" to the U.S. Army.
SOSA	Sensor Open Systems Architecture Consortium	The SOSA consortium is comprised of a growing list of industry partners and defense agencies, working together to create a common set of standards. Members, such as Elma Electronic and several of its industry partners, commit to participate in the development of the standards through participation in SOSA's technical working groups and outreach committees.
VITA	VMEbus International Trade Association	The industry trade association that governs all VITA standards. VITA helps grow the embedded computing ecosystem by uniting manufacturers and users through the acceptance and implementation of open technology standards, especially in critical embedded systems. VITA technologies address many of the common challenges found in embedded systems architectures: reliability of operation, difficult operating environments, long product lifecycles, demanding performance, system interoperability, data and system security, and ever shortening time-to-market windows.
RedHawk RTOS	Linux Real-Time Operating System from Concurrent Real-Time	RedHawk Linux is a real-time operating system designed by Concurrent Real-Time. With extremely low latency, advanced tuning features and real-time determinism, RedHawk for embedded applications is designed for embedded applications that need guaranteed hard real-time response, reliability and determinism.

ACRONYMS FOR TECHNOLOGIES & PROCESSES

Acronym	Stands for	Definition
AMQP	Advanced Message Queuing Protocol	A platform-agnostic, wire-level messaging protocol that safely transports real-time data and business transactions between applications, among organizations, within mobile infrastructures, and across the Cloud.
API	Application Programming Interface	A set of routines, protocols, and tools for building software applications that specifies how software components should interact to make it easier to develop a program by providing all the building blocks that a programmer can put together.
C2	Command and Control	set of organizational and technical attributes and processes ... [that] employs human, physical, and information resources to solve problems and accomplish missions
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance	(replaced by C5ISR) Acronym commonly used throughout the defense community in reference to organizational and technological attributes that can enhance, reinforce, or execute command and control strategies and directives within military and intelligence frameworks.
C5ISR	Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance	Updated acronym used throughout the defense community, from C4ISR, to include 'cyber'. Replaces previous usage of C4ISR. Also refers to the C5ISR Center in Aberdeen, MD.
CMOSS	C4ISR/EW Modular Open Suite of Standards	Suite of open architecture standards developed by the U.S. Army Communications-Electronics Research, Development and Engineering Center that allows communication components of military vehicles to share a common platform, enabling the convergence of hardware and software to improve C4ISR and EW capabilities.
CMS	Combat Management System	The computer system that connects a naval ship's sensors, weapons, data links, support measures and other equipment to the officers and staff performing the tasks in combat. Typical functions include sensor control, sensor data fusion, threat evaluation, weapons assignment, weapons control etc.
COE	Common Operating Environment	A method of bringing a common foundation of technologies and standards to stovepiped systems as software applications to provide with a vast range of tools in one user-friendly place – improving access to information, cybersecurity and efficiency, while reducing training and logistics.
CONOPS, CONOPs or ConOps	Concept of Operation	Originating in the IEEE, CONOPS "describes systems characteristics for a proposed system from a user's perspective. A CONOPS also describes the user organization, mission, and objectives from an integrated systems point of view and is used to communicate overall quantitative and qualitative system characteristics to stakeholders". In defense terminology, it is a statement that clearly and concisely expresses what the joint force commander intends to accomplish and how it will be done using available resources. CONOPS may also be used or summarized in system acquisition DODAF descriptions such as the OV-1 High Level Operational Concept Graphic.

ACRONYMS FOR TECHNOLOGIES & PROCESSES

Acronym	Stands for	Definition
COTS	Commercial-Off-The-Shelf	Products that are ready-made, available and designed to be implemented easily into existing systems without the need for customization.
DDS	Data Distribution Service	A middleware protocol and API standard for data-centric connectivity that integrates the components of a system together, providing low-latency data connectivity, extreme reliability and a scalable architecture.
EW	Electronic Warfare	Military activities that use electromagnetic energy to control the electromagnetic spectrum (RF, microwave, infrared) and attack an enemy. It supports command and control (C2) by allowing military commanders to communicate with forces, while preventing potential adversaries from accessing the spectrum, and develop an operational picture.
HOST	Hardware Open Systems Technology	NAVAIR with support from ARMY C4ISR and Air Force and Georgia Tech Research Institute (GTRI) (HOST references FACE and MOSA and VICTORY)
IMA	Integrated Modular Avionics	A concept that replaces numerous separate processors and line replaceable units (LRUs) with fewer, more centralized processing units that leads to significant weight reduction and maintenance savings in both military and commercial airborne platforms.
IPMB	Intelligent Platform Management Bus	An internal management bus that transmits data from one part of a system to another; used in IMPI for extending platform management within a chassis.
IPMC	Intelligent Platform Management Controller	A board level management tool that handles local module management responsibilities, representing that module to the chassis manager.
IPMI	Intelligent Platform Management Interface	A remote hardware health monitoring and management system that defines interfaces for use in monitoring the physical health of servers, such as temperature, voltage, fans, power supplies and chassis.
JCA	Joint Common Architecture	Along with FACE, one of the original initiatives (circa 2015) coordinated by the US Army to establish methods to reduce the time to develop and field new software capabilities and their lifecycle costs for future vertical lift aircraft.
MBSE	Model Based System Engineering	The formalized application of modeling to support system requirements, design, analysis, verification and validation activities beginning in the conceptual design phase and continuing throughout development and later life cycle phases.
MORA	Modular Open RF Architecture	U.S. Army Communications Electronics Research, Development and Engineering Center (CERDEC) at Aberdeen Proving Ground – VITA 49 is an implementation.
MOSA	Modular Open Systems Approach	A concept, not an entity or a standards group. Formerly known as Open Systems Architecture or Open Systems Approach, it can be defined as a technical and business strategy for designing an affordable and adaptable system. References to this concept are “peppered” through other activities such as HOST, SOSA and MORA.
OA	Open Architecture	A type of computer architecture or software architecture intended to make adding, upgrading and swapping components easy; allows potential users to see inside all or parts of the architecture without any proprietary constraints. Typically, all or part of an architecture that the developer or integrator wants to share is publicly available, possibly requiring license agreements between sharing entities.

ACRONYMS FOR TECHNOLOGIES & PROCESSES

Acronym	Stands for	Definition
OAM		The Open Architecture Management (OAM) is the activity that manages, sustains, and evolves the Open Architecture Management Standards (OAMS). The OAM standards consists of the Universal Command and Control Interface standard (UCI) and the Open Mission Systems (OMS) standard. The OAMS enable current, legacy, and new programs to realize the benefits of Open Architecture.
OMS	Open Mission Systems	Aims to develop industry consensus for a non-proprietary mission system architectural standard that enables affordable technical refresh and insertion, simplified mission systems integration, service reuse and interoperability, and competition across the lifecycle
OpenVPX	VITA 65 and suite of supporting standards	Defined in ANSI VITA 65.0. OpenVPX Systems may also comply to multiple families of related standards including but not limited to ANSI VITA 46.0, 46.9, 46.10, 46.11, 60, 62, 63, 65.1 66.0, 67.0 68.0, 78 and the results of the VITA84 Study Group.
OSA	Open System Architecture	Replaced by MOSA (see above). According to the DoD Open System Architecture Contract Guidebook for Program Managers, an Open Architecture is a technical architecture that adopts open standards supporting a modular, loosely coupled and highly cohesive system structure that includes publishing of key interfaces. A key enabler for Open Architecture is the adoption of an Open Business Model that requires doing business transparently to leverage collaborative innovation, permit shared risk, maximize asset reuse, and reduce total ownership costs.
OSS	Operating System Segment	One in a set of standardized FACE interfaces providing connections between its architectural segments. The FACE Reference Architecture defines three FACE OSS Profiles tailoring the Operating System (OS) Application Programming Interfaces (APIs), programming languages, programming language features, run-times, frameworks and graphics capabilities to meet the requirements of software components for differing levels of criticality. The three Profiles are Security, Safety, and General Purpose.
PNT	Positioning, Navigation and Timing	PNT is a combination of three distinct, constituent capabilities: 1) Positioning, the ability to accurately and precisely determine one's location and orientation referenced to a standard geodetic system 2) Navigation, the ability to determine current and desired position and apply corrections to course, orientation, and speed to attain a desired position anywhere around the world 3) Timing, the ability to acquire and maintain accurate and precise time from a standard anywhere in the world and within user-defined timeliness parameters.
POSIX	Portable Operating Interface for Unix	A set of standard OS interfaces based on Unix developed to enable software programs to be moved among different manufacturer's computer systems without having to be recoded. Informally, each standard is defined by a decimal following the POSIX, with the main two interfaces begin POSIX.1 (the standard for an application program interface in the C language) and POSIX.2 (the standard shell and utility interface; aka the user's command interface with the operating system)

ACRONYMS FOR TECHNOLOGIES & PROCESSES

Acronym	Stands for	Definition
RTOS	Real Time Operating System	An operating system optimized for use in embedded/real time applications with the primary objective of ensuring a timely and deterministic response to events. It allows a software application to be written as a set of independent tasks, with each task assigned a priority. The RTOS is responsible for ensuring that the task with the highest priority is the task that runs.
SCA	Software Communications Architecture	An open architecture framework that enables communication platforms (e.g. software defined radios) to load applications (e.g. waveforms), run these applications, and be networked into an integrated system by giving communications systems designers a roadmap of how elements of hardware and software are to operate in harmony within an SCA-compliant system.
VICTORY	Vehicle Integration for C4ISR/EW Interoperability	Vehicle Integration for C4ISR/EW Interoperability Defines standard interconnects for future networked armored combat vehicles.
VPX	VITA 46	Base mechanical standard in the family of OpenVPX standards. See OpenVPX.
SAR	Synthetic Aperture Radar	A synthetic-aperture radar is a 2D or 3D imaging radar mounted on a moving platform. SAR is capable of high-resolution remote sensing, independent of flight altitude, and independent of weather, as SAR can select frequencies to avoid weather-caused signal attenuation.
LIDAR	Laser Imaging Detection and Ranging (system)	LIDAR is a method to measure distance to a target by lighting it with laser light and measuring the reflected light with a sensor. Commonly used to make high-resolution maps; and UAS control and navigation.
TRL	Technology Readiness Level	Technology readiness levels (TRLs) are a method for estimating the maturity of technologies during the acquisition phase of a program. The use of TRLs enables consistent, uniform discussions of technical maturity across different types of technology. TRLs are based on a scale from 1 to 9 with 9 being the most mature technology. The US DoD has used the scale since the early 2000s.
UCI	Universal Command and Control Interface	The Universal Command and Control Interface [formerly the Unmanned Aerospace Systems (UAS) Command and Control (C2) Standard Initiative] establishes a set of messages for machine-to-machine, mission-level command and control for airborne systems. The UCI vision is to decrease acquisition and operational costs of manned and unmanned systems and enable interoperability.

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