



# SYSTEMS ENGINEERING & ARCHITECTURE

ORGANIZATIONAL HIGHLIGHT:

FEBRUARY 2024

## JOINT ARCHITECTURE FOR CAPABILITIES AND SYSTEMS (JACS)

JACS

The Under Secretary of Defense for Research and Engineering (USD(R&E))/Chief Technology Officer tasked the office of Systems Engineering and Architecture (SE&A) to develop an enterprise-wide strategy for systems of systems (SoS) to ensure successful integration and interoperability. SE&A established the Joint Architecture for Capabilities and Systems (JACS) directorate to lead this effort.

### ❖ THE CHALLENGE

The Department of Defense (DoD) requires guidance, strategy, and standards for enterprise-level SoS engineering and architecture to integrate mission systems and provide fully networked command, control, and communications capable of evolving at the necessary speed to sustain U.S. warfighter advantage.

The SE&A JACS Directorate seeks to take full advantage of expertise and solutions available in industry and academia and to ensure the DoD enterprise is in compliance with associated departmental policy. JACS has established a mission, vision, and lines of effort to address this challenge.



Figure 1. JACS encompasses a global network of systems.

### JACS MISSION

Promote, guide, and establish an *enterprise-wide environment and cultural approach* to deploy system-of-systems (SoS) engineering and architecture.

### JACS VISION

Support the Department in sustaining *warfighting dominance through SoS engineering and architecture*.

### ❖ JACS LINES OF EFFORT

#### Governance

An organizational construct is an important component of the JACS plan to achieve its mission and vision. The JACS approach to governance includes identifying and establishing an organization with the authority and resources to help the DoD increase integration and interoperability across the enterprise. The governance line of effort will focus its resources on the following:

- Establish a governance structure with authority and resources.
  - Build a DoD Systems Engineering and Architecture Community of Practice (CoP) by identifying and recruiting subject matter experts and leadership.
- Draft a DoD systems engineering and architecture strategy and validate that the strategy meets capability and deployment objectives.
- Develop and support the implementation of policy in line with the validated DoD systems engineering and architecture strategy.



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### ❖ JACS LINES OF EFFORT *continued*

#### Common Foundation

During the initial planning phases of JACS, the team discovered that systems engineering and architectures across the enterprise lack common terminology, definitions, and methods. Establishing standards and a common framework for requirements will provide the Department with the necessary foundations for success in its endeavor to establish a common architecture. To achieve this line of effort, the JACS team will work on the following items to develop, implement, and sustain a common foundation:

- Develop definitions and standards for key systems engineering and architecture terms.
- Begin initial planning stages for establishment of a foundational layer approach to architecture requirements and interfaces.
- As needed, update existing and devise new Defense Acquisition University (DAU) instruction to educate the workforce on SoS engineering and architecture concepts and methodologies.



Figure 2. JACS involves all DoD domains.

#### Culture

The creation, adoption, and use of an enterprise approach presents huge programmatic and organizational cultural challenges. Encouraging interaction and collaboration across and among Departments and Services, as well as with allies and partners, will help the Department establish cultural norms and expectations. Establishing an effective SoS architecture culture is a long-term line of effort that will start with the following steps:

- Provide the CoP with opportunities to share best practices and pain points.
- Develop and implement a forum for sharing and implementing concepts, best practices, and ideas.
- Develop a communication plan on the vision for change.

#### Environment

Successful adoption of an SoS architecture requires development, employment, adoption, and use of an enterprise environment. It is important for the Department to create the tools to support the development, implementation, and sustainment of an enterprise architecture. Establishing an enterprise-wide environment will require the following steps:

- Implement a modeling and simulation and digital engineering environment and requirements framework to support SoS development, implementation, and sustainment.
- Implement and manage a plan to define, fund, analyze, and measure an integrated DoD enterprise architecture.
  - Implement a feedback mechanism that allows for continuous improvement based on experience and lessons learned.

**JACS is system-of-systems engineering and architecture for the DoD enterprise**

#### ❖ RESOURCES

OUSD(R&E) SE&A: <https://www.cto.mil/sea/>

JACS: <https://www.cto.mil/sea/jacs>

Email: [osd-sea@mail.mil](mailto:osd-sea@mail.mil) | Subject: Attn JACS

