TLP:CLEAR

DOT/FAA/TC-693KA8-23-F-00190/TO 26

Federal Aviation Administration
William J. Hughes Technical Center
Aviation Research Division
Atlantic City International Airport
New Jersey 08405

Part 4: Cybersecurity Data Science (CSDS) Aviation Architecture Framework (AAF) - Glossary & Acronyms

August 23, 2024

Version 1

U.S. Department of Transportation
Federal Aviation Administration

NOTICE

This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The U.S. Government assumes no liability for the contents or use thereof. The U.S. Government does not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the objective of this report. The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the funding agency. This document does not constitute FAA policy. Consult the FAA sponsoring organization listed on the Technical Documentation page as to its use.

This report may be available upon request to the FAA Aviation Research Division.

TLP:CLEAR

Technical Report Documentation Page

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

1. Report No. DOT/FAA/TC-693KA8-23-F-00190/TO 26	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Title of Report: Cybersecurity Data Science Aviation Architecture Framework Subtitle of Report: Glossary & Acronyms		5. Report Date August 2024 6. Performing Organization Code
7. Author(s) Center for Aerospace Resilient Systems (CARS) Daniel Diessner Dr. M. Ilhan Akbas Isidore Venetos		8. Performing Organization Report No.
9. Performing Organization Name and Address Embry-Riddle Aeronautical University Center for Aerospace Resilient Systems (CARS) 1 Aerospace Blvd. Daytona Beach, Florida, 32114		10. Work Unit No. (TRAIS) 11. Contract or Grant No. DOT/FAA/TC-693KA8-23-F-00190/TO 26
12. Sponsoring Agency Name and Address The William J. Hughes Technical Center Aviation Research Division ANG-2 Federal Aviation Administration - FAA. Atlantic City International Airport, Egg Harbor Township, NJ 08405		13. Type of Report and Period Covered 14. Sponsoring Agency Code ANG-271
15. Supplementary Notes		

16. Abstract

This is the fourth part of a series of four (4) core documents to provide an overview of the top-down output from the FAA Cybersecurity Data Science Aviation Architecture Framework (CSDS AAF) research program. The intent of this technical specification document is to provide an ontology for the CSDS AAF. It also provides a narrative to describe and explain all of the key AAF components and functions, coupled with diagrams to illustrate the overall AAF structure. The four (4) core CSDS AAF documents are:

- **Part 1 CSDS AAF – Overview & Value Proposition**: The primary purpose is to communicate aviation stakeholders the vision and potential value of the FAA CSDS research and generally how it could potentially be leveraged to address key aviation cybersecurity challenges.
- **Part 2 CSDS AAF – Technical Definition**: As an ontology for the CSDS AAF, this document provides a narrative to describe and explain all of the key AAF components and functions, coupled with diagrams to illustrate the overall AAF structure.
- **Part 3 CSDS AAF – Implementation Guidance**: This document provides guidance for the implementation of the CSDS AAF, which is defined in the AAF Technical Definition.
- **Part 4 CSDS AAF – Glossary & Acronyms:** This document provides the Glossary and Acronym material for all parts of the CSDS AAF documentation.

17. Key Words AAF, Aviation, Artificial Intelligence, Cybersecurity, Data Science, Machine Learning, Strategy	18. Distribution Statement This report may be made available upon request to the FAA Aviation Research Division.

19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages	22. Price

TLP:CLEAR

Contents

Figures

No table of figures entries found.

1 Introduction

This is the fourth part of a series of four (4) documents to provide an overview of the top-down output from the FAA Cybersecurity Data Science Aviation Architecture Framework (CSDS AAF) research program. Specifically, this document provides the Glossary and Acronym material for all parts of the CSDS AAF documentation. The four (4) core CSDS AAF documents are:

- **CSDS AAF – Part 1: Overview & Value Proposition**: The primary purpose is to communicate to aviation stakeholders the vision and potential value of the FAA CSDS research and generally how it could potentially be leveraged to address key aviation cybersecurity challenges (Embry-Riddle Aeronautical University Center for Aerospace Resilient Systems, 2024).
- **CSDS AAF – Part 2: Technical Definition**: As an ontology for the CSDS Aviation Architecture Framework, this document provides a narrative to describe and explain all of the key AAF components and functions, coupled with diagrams to illustrate the overall AAF structure (Embry-Riddle Aeronautical University Center for Aerospace Resilient Systems, 2024).
- **CSDS AAF – Part 3: Implementation Guidance**: This document provides guidance for the implementation of the CSDS AAF, which is defined in the AAF Technical Definition (Embry-Riddle Aeronautical University Center for Aerospace Resilient Systems, 2024).
- **CSDS AAF – Part 4: Glossary & Acronyms**: This document provides the Glossary and Acronym material for all parts of the CSDS AAF documentation (Embry-Riddle Aeronautical University Center for Aerospace Resilient Systems, 2024).

2 Glossary

- **Analytical Functional Elements** – Interact with and on data in the CSDS process; one of the CSDS Conceptual Efforts; examples include Collectors and Cyber Tools Sets [Part 2].
- **Application Data** – Data from application log files or operating systems log files that include data such as client requests, server responses, etc. [Part 2]
- **Artifact** – Results of an analysis produced by a toolset; may contain sensitive/proprietary information [Part 2].

- **Automatic Remote Extraction (Bilateral)** – Automatically connect and request data at scheduled intervals from the Data-Store [Part 2].
- **Aviation Domain** – Major branch of civil aviation infrastructure; CSDS AAF identifies six Aviation Domains of interest: Aircraft/Airline Operators; Aircraft OEMs / Supply Chains – Design & Production; Airport Operators; Airspace Management; Data/Communication Service Providers (CSP); and Maintenance/Repair/Overhaul (MRO) Providers [Part 2].
- **Cyber Analytical Capability (CAC)** – Represents the stakeholder's collective functional cyber capabilities for a given EOO [Part 2].
- **Cybersecurity Data Science (CSDS)** – Application of data science to cybersecurity due to the ever-increasing volume of cybersecurity data [Part 2].
- **Cybersecurity Data Science Aviation Architecture Framework (CSDS AAF)** – System-of-systems approach for applying a top-down CSDS framework across the entire aviation ecosystem [Part 1].
- **CSDS AAF Data Life Cycle** – Six-phase life cycle of Acquire, Pre-Analyze, Collect, Curate, Advance Analytics, and Information Sharing that describes the flow of data in the CSDS AAF [Part 2].
- **Data Acquire Elements** – Individual interconnected system components essential for acquiring data; one of the CSDS Conceptual Efforts; examples include Data Acquisition Sensors and Local Stored Data [Part 2].
- **Data Acquisition Sensor** – Sensor that monitors data generated on systems and networks and evaluates data relevancy [Part 2].
- **Data Egress Point** – Specialized IIS device with an EOO whose job is to receive and transmit cyber-relevant data to Data-Store [Part 2].
- **Data Manager** – Person or entity responsible for enforcing policies and access to data as dictated by the Data Owner(s) [Part 2].
- **Data Owner** – Person or entity that is accountable for who has access to information assets within their functional area(s) [Part 2].
- **Data Science** – Extraction of knowledge or insights from structured and unstructured data using analytical methods such as statistics, data mining, and predictive analytics [Part 2].
- **Data Sphere** – Set of all data that is acquired from IIS [Part 2].
- **Data-Store** – Collection of all storage devices, both local and cloud-based, in an Environment of Operation [Part 2].
- **Domain Stakeholder** – Stakeholder of a specific Aviation Domain [Part 2].

- **Environment of Operation (EOO)** – Comprised of the systems and networks that provide an operational capability, specific mission, or business function for aviation [Part 2].
- **Interconnected Individual System (IIS)** – Contains the individual software and hardware components that provide the capabilities of the Environment of Operation [Part 2].
- **Local Storage Devices** – Storage devices located within the Interconnected Individual System [Part 2].
- **Manual Physical Extraction** – Physically connect to and request data sporadically from the Data-Store [Part 2].
- **Manual Remote Extraction** – Remotely connect and request data sporadically from the Data-Store [Part 2].
- **Log** – Record of events occurring within an organization's systems and networks [Part 2].
- **Network Data** – Network data collected by the IIS and typically includes network activity logs from routers, switches, and DNS servers [Part 2].
- **On-Premise Storage Devices** – Storage devices physically located in the same facilities as the Interconnected Individual System [Part 2].
- **Operational Systems Data** – Data from Operational Technology system [Part 2].
- **Primary Actors** - Entities responsible for developing and/or implementing the policies, procedures, and technologies at each layer of the framework in supporting the CSDS AAF [Part 2].
- **Remote Near Real-Time Extraction (Unilateral)** – Near Real-Time streaming of the collected data directly from the IIS instead of the Data Store [Part 2].
- **Remote Storage Devices** – Storage devices located in an external geographical location [Part 2].
- **Security Data** – Security related data collected as logs or streamed from the systems [Part 2].
- **Shareable Artifact** – An artifact with sensitive/proprietary information removed [Part 2].
- **Theoretically Optimal Relevant Data** – Represents the theoretically correct data requirements with provides the CSDS Use Cases with the best chance of success to provide the most accurate results when answering the 3 key CSDS questions [Part 2].

3 Acronyms

AAF	Aviation Architecture Framework
AAM	Advanced Air Mobility
ACI	Aviation Cyber Initiative
ACMS	Aircraft Condition Monitoring Systems
AEEC	Airlines Electronic Engineering Committee
AI	Artificial Intelligence
AI/ML	Artificial Intelligence/Machine Learning
AIA	Aerospace Industries Association
AIMS	Airplane Information Management System
A-ISAC	Aviation Information Sharing & Analysis Center
AISS	Aeronautical Information System Security
ANSP	Air Navigation Service Provider
APT	Advanced Persistent Threat
ARINC	Aeronautical Radio, Incorporated
AWS	Amazon Web Service
BSON	Binary JavaScript Object Notation
CAC	Cyber Analytical Capability
CARS	Center for Aerospace Resilient Systems
CAST	Commercial Aviation Safety Team
CBOR	Concise Binary Object Representation
CISO	Chief Information Security Officer
CJIS	Criminal Justice Information Systems
COTS	Commercial Off The Shelf
CSCAT	Cyber Safety Commercial Aviation Team
CSDS	Cyber Security Data Science
CSP	Communication Service Provider
CSRC	Computer Security Resource Center
CSV	Comma-Separated Values
CTO	Chief Technology Officer
DAS	Data Acquisition Sensors
DDoS	Distributed Denial-of-Service
DEP	Data Egress Point
DoD	Department of Defense
DTD	Document Type Definition
EAR	Export Administration Regulations
EOO	Environment of Operation
EUROCAE	European Organization for Civil Aviation Equipment
FAA	Federal Aviation Administration
FOUO	For Official Use Only
HSM	Hardware Security Module
HW	Hardware
IaaS	Infrastructure as a Service
IATA	International Air Transport Association

ICAO	International Civil Aviation Organization
ICS	Industrial Control System
IEMS	Information Exchange Messaging System
IIoT	Industrial Internet-of-Things
IIS	Interconnect Individual System
IoT	Internet-of-Things
ISEM	Information Security Event Management
ISP	In-System Programming
IT	Information Technology
ITAR	International Traffic in Arms Regulations
JSON	JavaScript Object Notation
JTAG	Joint Test Action Group
KBA	Knowledge-Based Authentication
LRU	Line Replaceable Units
MFA	Multi-Factor Authentication
ML	Machine Learning
MOC	Means of Compliance
MRO	Maintenance, Repair, and Overhaul
NAS	Network Attached Storage
NIST	National Institute of Standards and Technology
OEM	Original Equipment Manufacturer
OT	Operational Technology
OTA	Over-The-Air
OTP	One-Time-Passwords
PaaS	Platform as a Service
PIESD	Passenger Information and Entertainment Systems Domain
PII	Personally Identifiable Information
PSO	Product Security Officer
QoS	Quality of Service
R&D	Research and Development
RAID	Redundant Arrays of Independent Disks
RFID	Radio Frequency Identification
RTCA	Radio Technical Commission for Aeronautics
S3	Simple Storage Service
SaaS	Software as a Service
SAN	Storage Area Network
SBOM	Software Bill of Materials
SGD	System Guidance Document
SOC	Security Operation Center
SOW	Statement of Work
SRG	Security Requirements Guide
SW	Software
TAP	Test Access Port
TLS	Transport Layer Security

TSBD	Time-Based Database
TTX	Tabletop Exercise
US ACCESS	US Aviation Coordination of Cybersecurity & E-enabled Standards Strategy
XML	eXtensible Markup Language
ZTA	Zero-Trust Architecture

4 References

Embry-Riddle Aeronautical University Center for Aerospace Resilient Systems. (2024). *Part 1: Cybersecurity Data Science (CSDS) Aviation Architecture Framework (AAF) - Overview & Value Proposition.* Atlantic City, NJ: FAA NextGen Cybersecurity Data Science Project.

Embry-Riddle Aeronautical University Center for Aerospace Resilient Systems. (2024). *Part 2: Cybersecurity Data Science (CSDS) Aviation Architecture Framework (AAF) - Technical Definition.* Atlantic City, NJ: FAA NextGen Cybersecurity Data Science Project.

Embry-Riddle Aeronautical University Center for Aerospace Resilient Systems. (2024). *Part 3: Cybersecurity Data Science (CSDS) Aviation Architecture Framework (AAF) - Implementation Guidance.* Atlantic City, NJ: FAA NextGen Cybersecurity Data Science Project.

Embry-Riddle Aeronautical University Center for Aerospace Resilient Systems. (2024). *Part 4: Cybersecurity Data Science (CSDS) Aviation Architecture Framework (AAF) - Glossary & Acronyms.* Atlantic City, NJ: FAA NextGen Cybersecurity Data Science Project.