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FUTURE.**

# ESAF 2025 Regional Aeronautical Meteorology Workshop



Movenpick Hotel: Nairobi, Kenya  
*7-8 July 2025*

# SWIM and Implementation of AMET ASBU Elements

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ICAO ESAF 2025 Regional Workshop on Aeronautical Meteorology

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# Presentation Overview

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# The System Wide Information Management (SWIM) Concept

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# Manual on the System-wide Information Management (SWIM) Concept

## ICAO Doc 10039

- Considering the expected growth and diversity in aviation demand, economic pressures and environmental factors, the ATM system increasingly relies on accurate and timely information.
- This information must be organized and provided by
  - systems that support global interoperability,
  - while its access and exchange should be seamless and secure.
- Global improvements in information management are needed to integrate ATM supporting systems in a performance enhancing manner. These improvements are envisioned to be applied **system-wide**.



ICAO

Doc 10039

Manual on the System-wide Information Management (SWIM) Concept

First Edition, 2024



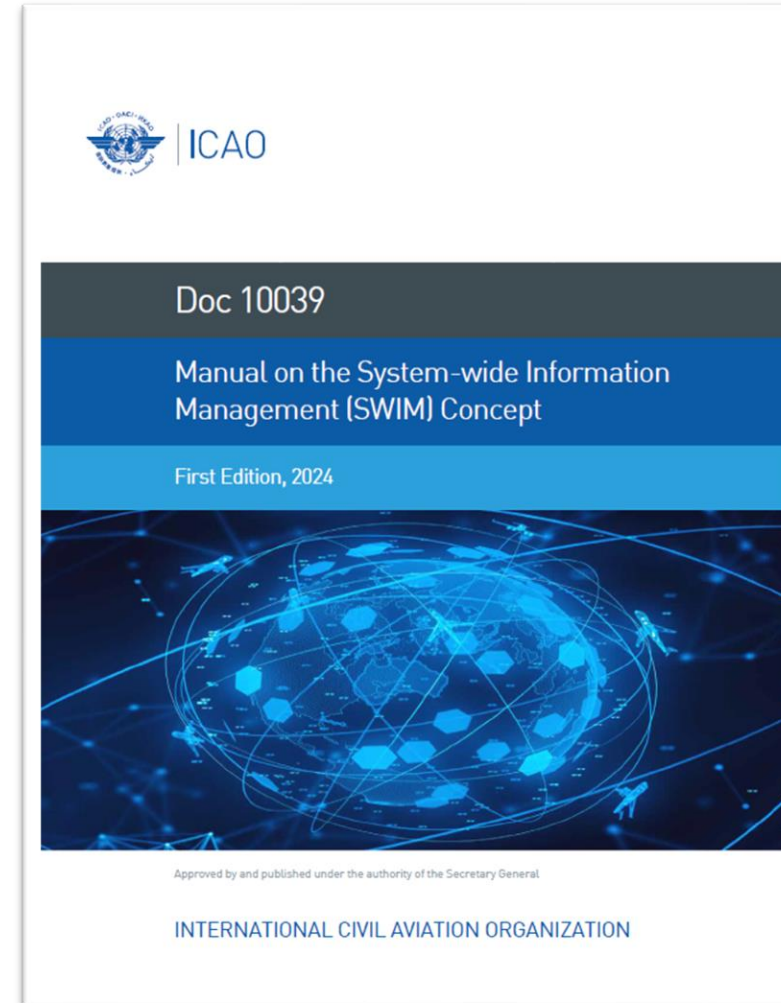
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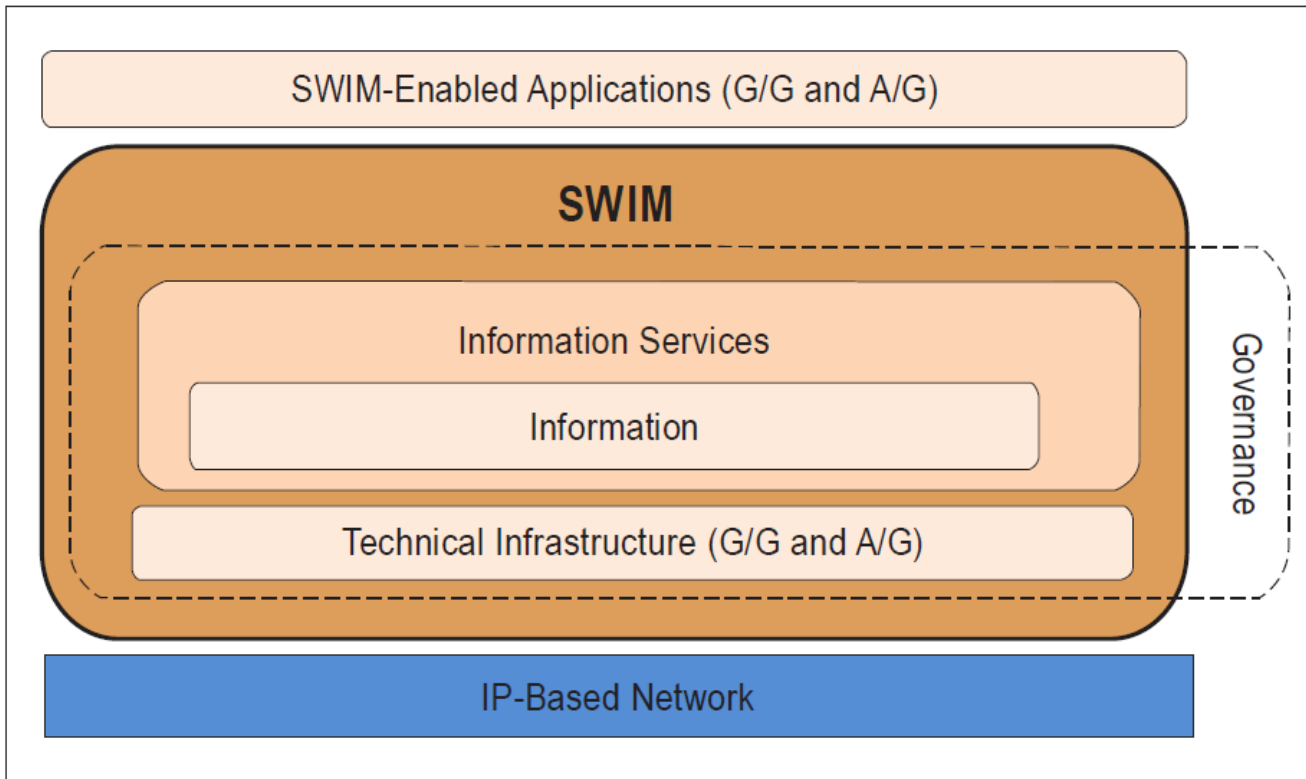
INTERNATIONAL CIVIL AVIATION ORGANIZATION

## ICAO Doc 10039

- **System-wide information management (SWIM) supporting provisions:**
  - should be aligned with a globally accepted operational concept
  - that articulates the expected benefits, enablers, features and principles for the development of and transition to, a SWIM operational scenario.
- The SWIM concept presented in this manual describes:
  - the aspects of stakeholder participation,
  - governance and operation at the technical development
  - implementation levels (for businesses and institutions) for SWIM.

***Interoperability:** The ability of information and communication technology (ICT) systems, and of the business processes they support, to exchange data and to enable the sharing of information and knowledge.*



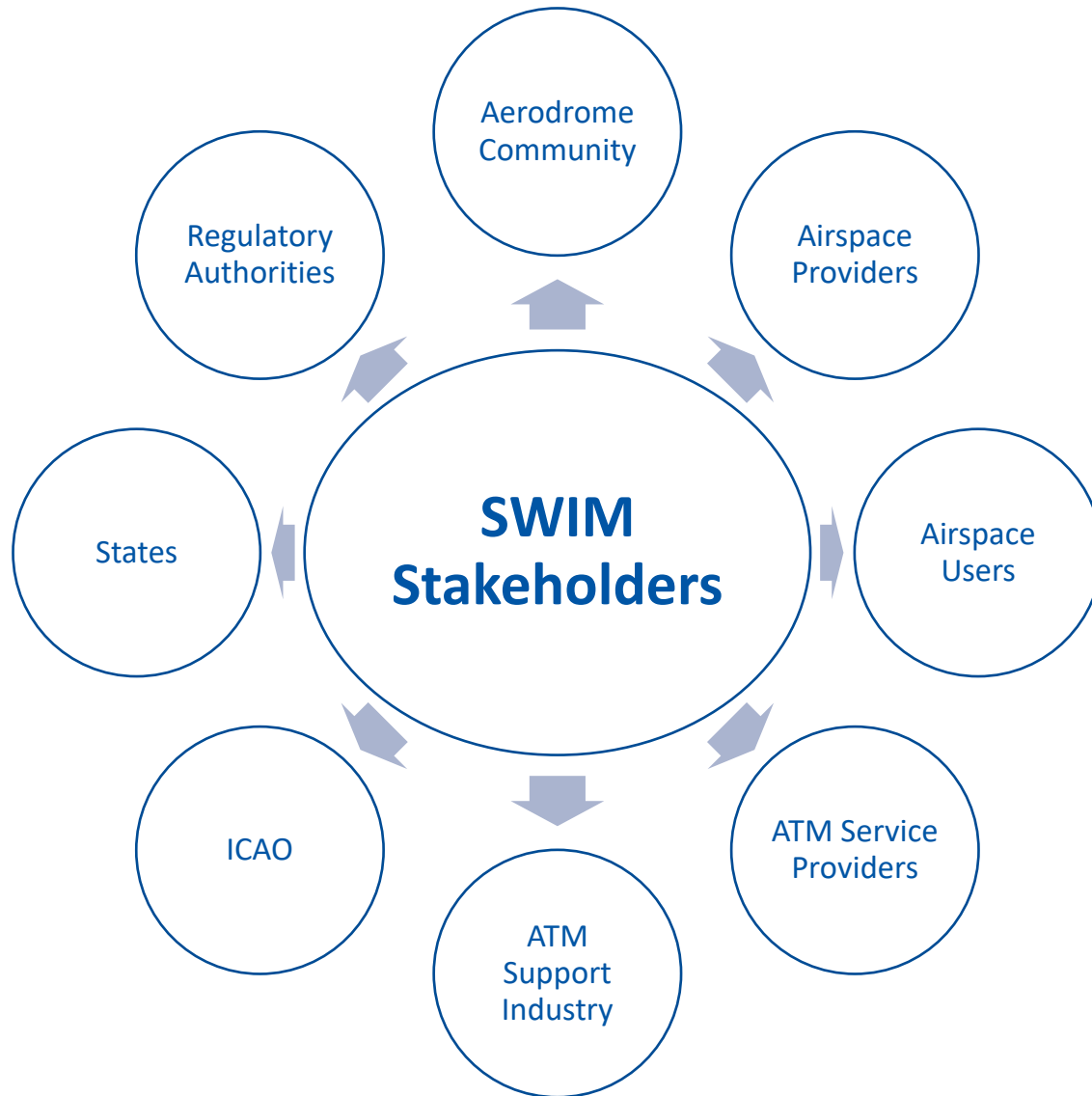


## Core components:

- **Information:** ATM-related data (e.g., MET, AIM, FPL)
- **Information Services:** Interfaces that enable access and exchange of information
- **Technical Infrastructure:** IP-based networks and systems supporting data flow
- **Governance:** Policies and standards ensuring quality, security, and interoperability(see Figure on the LHS).

## How it works:

- **SWIM** enables **interoperable information exchange** between qualified parties.
- **SWIM-enabled applications** use **information services**, which operate over **IP-based infrastructure**.



## SWIM Stakeholders and Roles

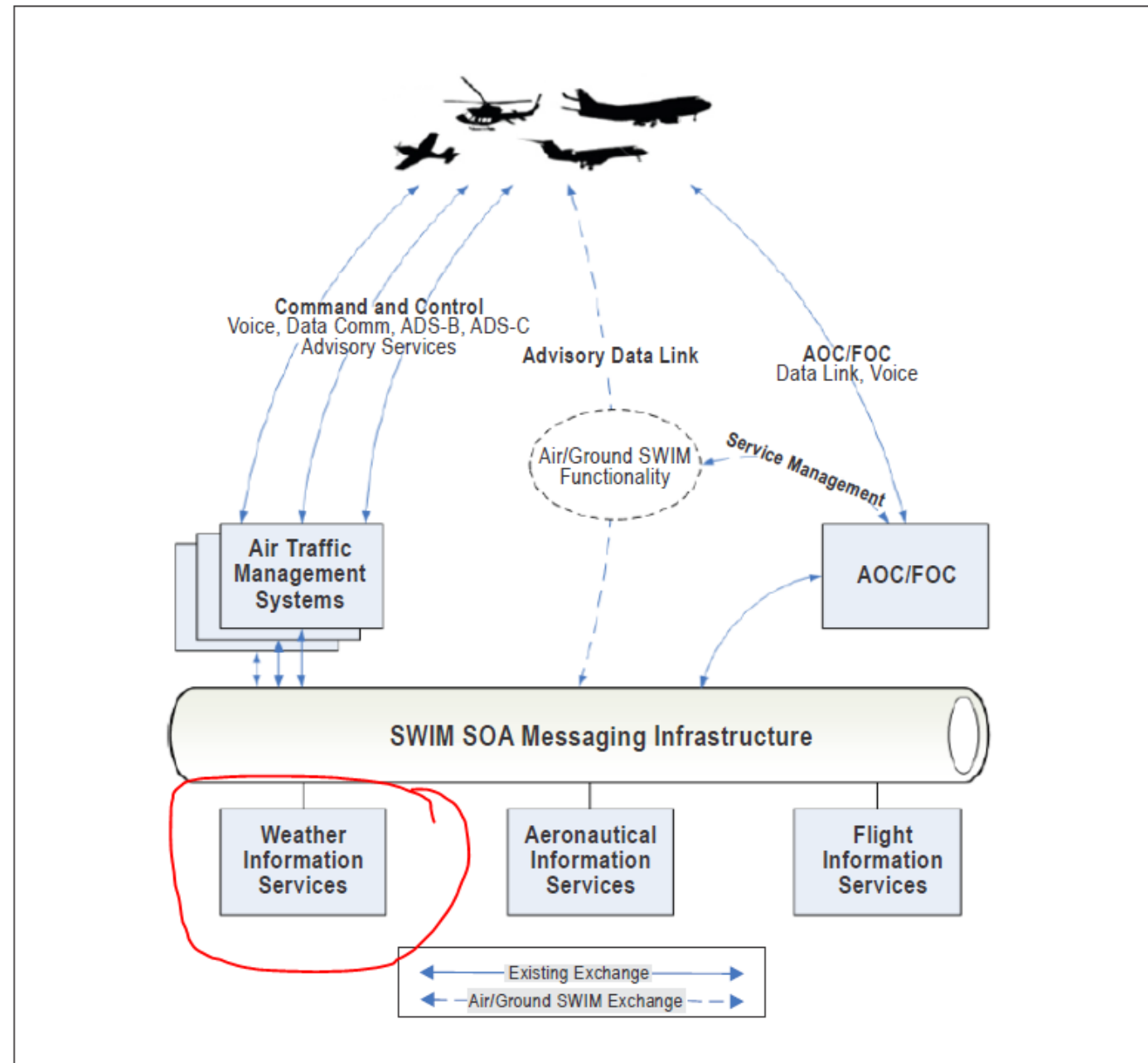
- Various SWIM stakeholders and roles
- The Global ATM Operational Concept (Doc 9854)
  - lists and describes the various members comprising the ATM community as shown in the diag.
- Some of these members (e.g. ICAO, States and regulatory authorities)
  - will be mainly responsible for the governance in SWIM.

# The Scope of SWIM

- Various SWIM stakeholders and roles
- SWIM is applied to MET services to enhance the air-ground information exchange by
  - enabling standardized, interoperable, and timely dissemination of MET data.

## 1. Service-Oriented Architecture (SOA):

- MET data is shared as **information services** (e.g., turbulence forecasts, SIGMETs, METARs) using web-based technologies.
- These services are **discoverable, reusable, and interoperable**, allowing pilots, air traffic controllers, and systems to access real-time MET data.



Example of air-ground information exchange based on SWIM

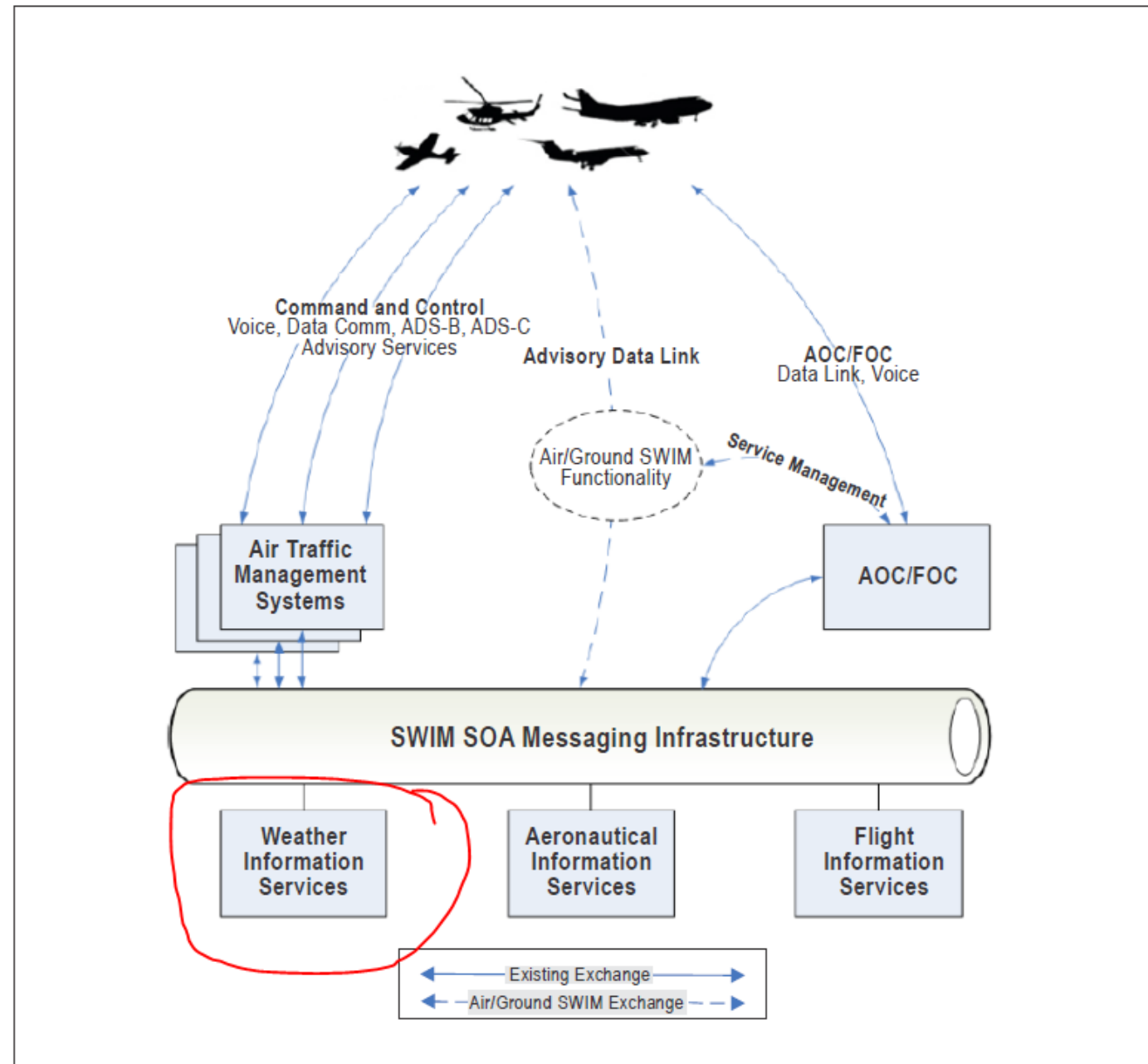
# The Scope of SWIM

## 2. Use of Standardized Models:

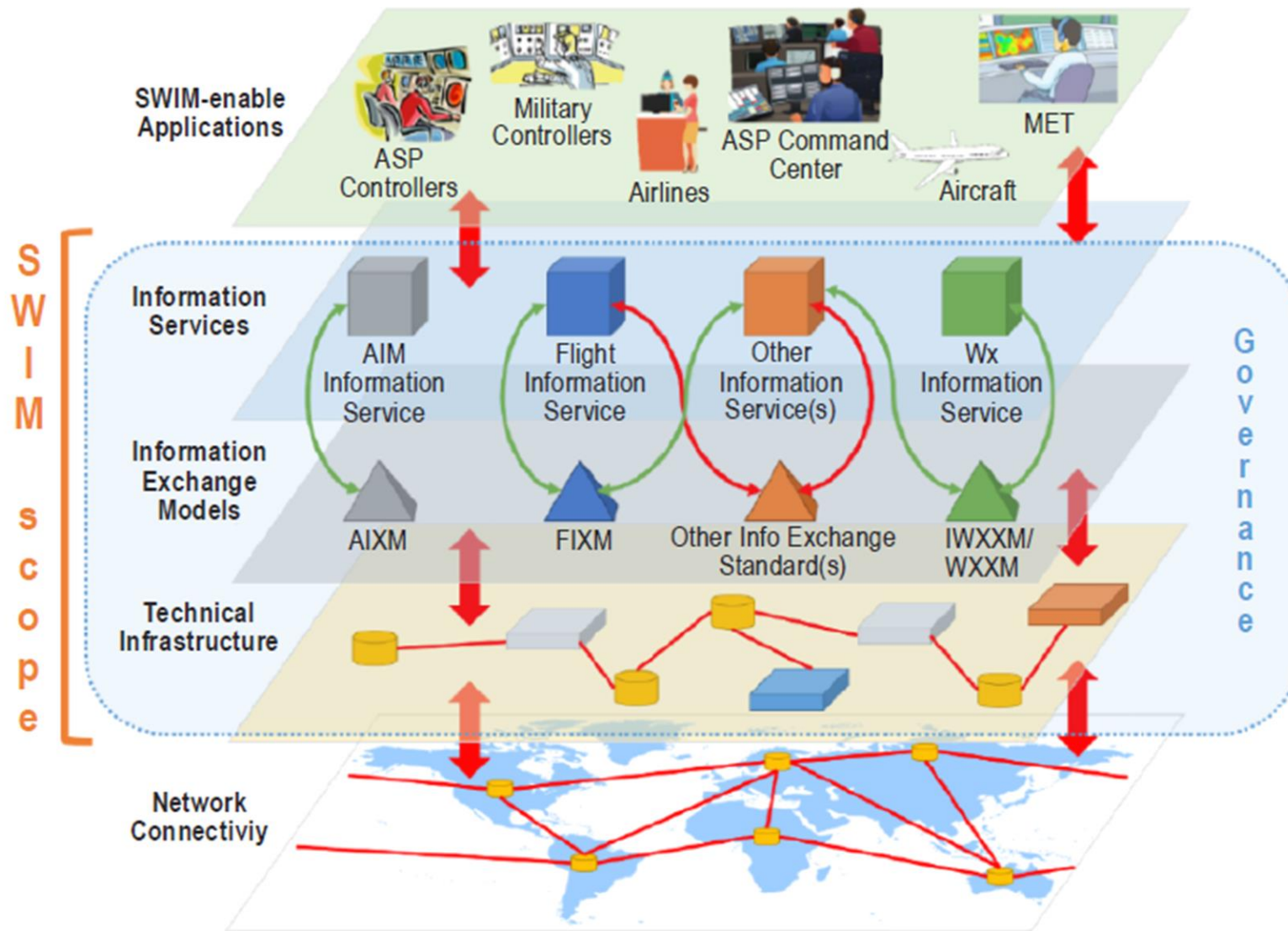
- SWIM uses IWXXM for encoding MET data.
- This ensures consistency and machine-readability across systems globally.

## 3. Integration with Other Domains:

- MET-SWIM interfaces with **Aeronautical Information Management (AIM)** and **Flight Information Regions (FIRs)** to provide context-rich data (e.g., weather at specific runways or FIR boundaries).



Example of air-ground information exchange based on SWIM



The five-layered SWIM global interoperability framework

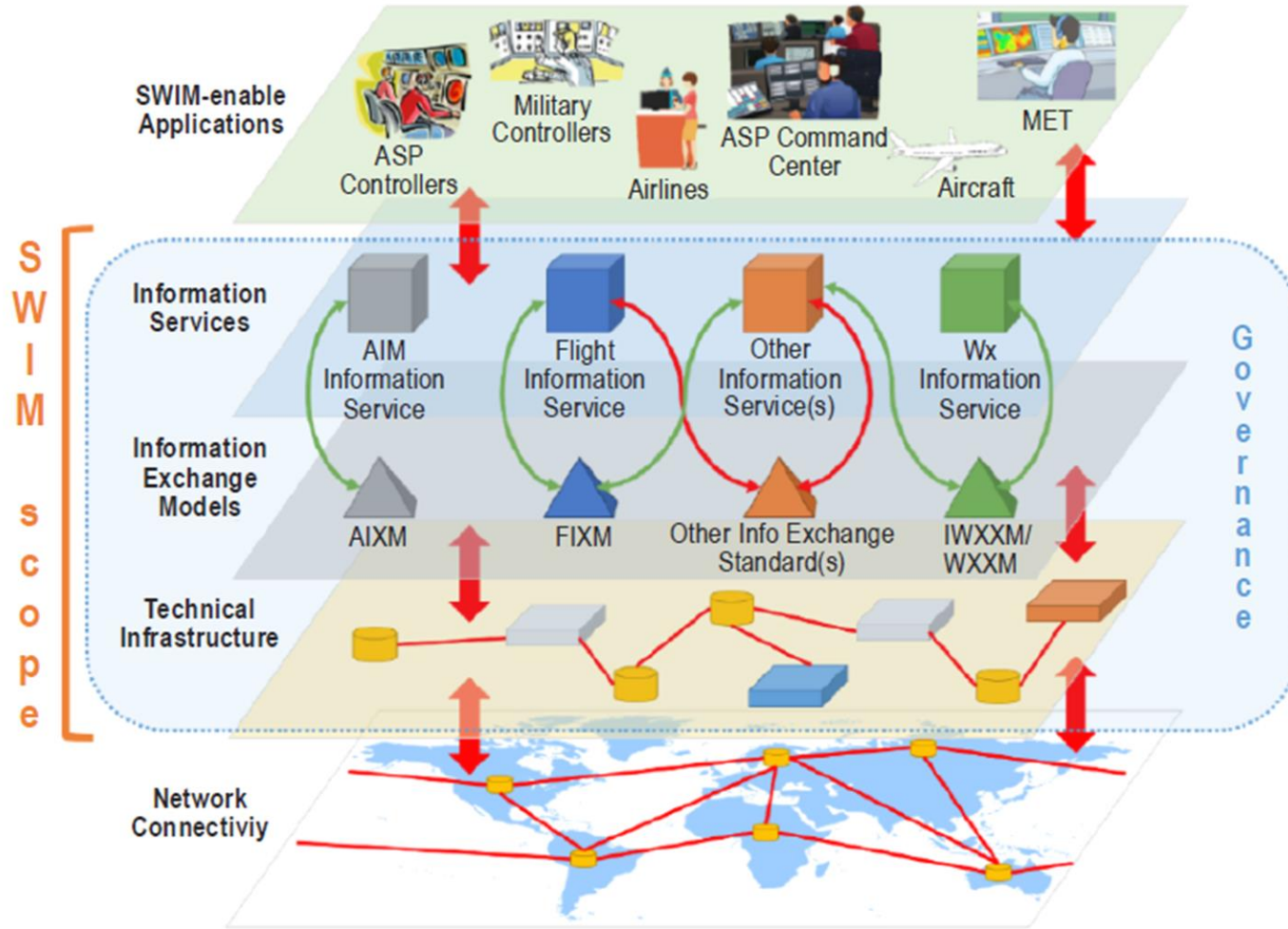
## The Global Interoperability Framework

Interoperability frameworks:

- useful tools to structure the complexity of interoperability.
- focus on the essential aspects to be shared and considered by all involved stakeholders.

# The Global Interoperability Framework

12



The five-layered SWIM global interoperability framework

The five-layered SWIM global interoperability framework:

- represents the sharing of information via SWIM and is based on several complementary descriptions of SWIM from its stakeholders.
- The layers explain the functions, the combination of representative standards and the mechanisms for interoperability.

*Although this illustration of the five layers focusses on the technical elements of ground-ground SWIM, it is consistent with the air-ground SWIM solutions that are being developed.*

# SWIM related AMET ASBU Elements

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## MET-SWIM Concepts and SWIM related ASBU Elements

MET-SWIM is a subset of the larger SWIM system and will interface with other SWIM components:

### Registries and Metadata

- The fundamental purpose of the SWIM registry (also known as a **catalogue**) is to provide a repository of information about who are the available information service providers, and what services and information each provides.

## MET-SWIM Concepts and SWIM related ASBU Elements

### MET-SWIM Information Service Consumer Resources:

A MET-SWIM information service consumer relies on several key resources from the SWIM registry:

- **Web Services:** Access to available services from various providers.
- **Service Descriptions:** Documentation detailing how each service works.
- **Reference Models:** Common frameworks like AIRM for consistent service and data structure implementation.
- **Exchange Standards:** Formats such as AIXM, IWXXM, and FIXM for standardized data sharing.
- **Policies:** Rules and constraints, including security requirements.
- **Compliance:** Levels of adherence to SWIM standards.
- **Participants:** Identified service providers within the SWIM ecosystem.

# AMET ASBU Elements related to MET-SWIM

ASBU Element	ASBU Element Title	ASBU Element Description	Timeline
AMET-B1/4	Dissemination of MET Information	Represents the <b>dissemination</b> of meteorological products using a variety of formats	2019 – 2024
AMET-B2/4	MET Information Service in SWIM	Establishes <b>standards for global exchange</b> of the MET information within the SWIM environment	2025 – 2030
AMET-B3/4			2031 – 2036
AMET-B4/4			2037 – 2042

# ESAF ASBU Dashboard Demo.

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# ASBU Implementation

## ESAF ASBU Implementation Dashboard

### Available on iSTARS

- 2 Focal Points per State
- AMET B0 and B1

**THE ANALYTICS PLATFORM FOR ICAO EASTERN & SOUTHERN AFRICA REGIONS**

The ESAF Office is one of the Organization's implementation arms accredited to 24 States in the Eastern and Southern Sub Regions of Africa. Its corporate mission is to closely liaise with the States, appropriate organizations, and regional civil aviation bodies, to promote ICAO policies, decisions, standards and recommended practices and air navigation plans, and provide assistance whenever possible.

**DASHBOARDS**

- AERODROME CERTIFICATION
- SAFETY MANAGEMENT
- CNS
- SAFETY-USOAP
- ENVIRONMENT
- ASBU
- ASBU MANAGEMENT

# Available on the iSTARS Platform

- List of nominated FPs
  - 2 per State
  - Contact your FP and ensure AMET data is uploaded
  - For presentation at the PIRG Sub-Group Meetings
    - IIMSG from 4-8 August 2025
- Granting Access to the Dashboard
  - Demo
- Submission of data by the FPs
  - Demo
- Data Visualisation
  - Demo



Data Visualisation

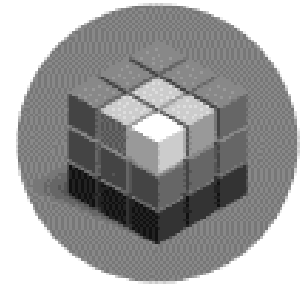


- **ESAF States**

- To ensure that the ASBU FPs and support with data submission for MET
- Contact ICAO for support with regards to IWXXM
  - Buddy Partnerships with other States
  - Guidance
- To participate in the ICAO IWXXM Virtual Workshop in September 2025



Global Air  
Navigation Plan



Aviation System  
Block Upgrades

## Questions?



Thank You!