

# **System Wide Information Management (SWIM)**

ICAO EUR/NAT and MID Seminar on SWIM  
(Tbilisi, Georgia, 23-25 June 2026)

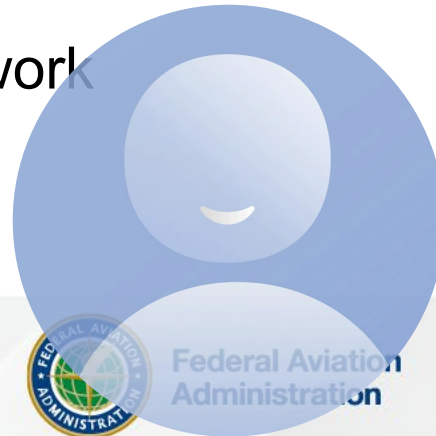


# U.S. National Airspace System (NAS)



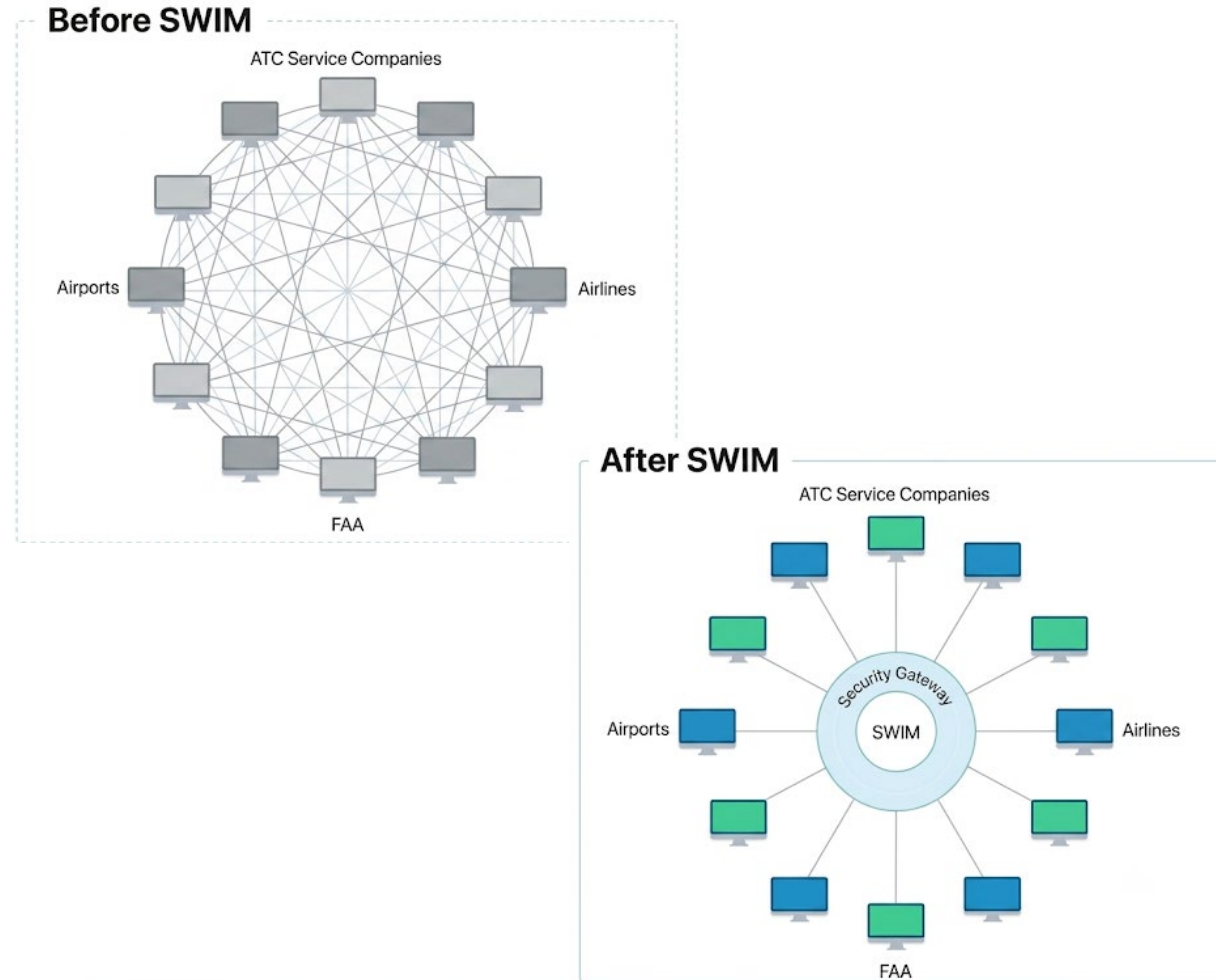
## Information Management Challenge:

- Custom, point-to-point, application-level data interfaces and fixed network connections for information exchange between supporting systems
- High telecommunications and maintenance cost



# Origins of System Wide Information Management (SWIM)

- FAA Program launched in 2007
- Single point of access for aviation data and publish/subscribe architecture
- Enables data producers to publish information once, allowing multiple authorized consumers to access it through a single connection



# Outcome



Air Traffic Management systems are integrated with the SWIM platform



Information Services accessible by airlines, airports, service providers, international partners and other government agencies



Improved protection of NAS systems and sensitive information



Reduced telecommunications costs for information exchanges

# ICAO Global Interoperability Framework (GIF)

## SWIM Layers

### SWIM Enabled Applications

Top layer where Service Producers and Consumers to interact with the information

### Information Services

Defines service characteristics

### Information Exchange Models

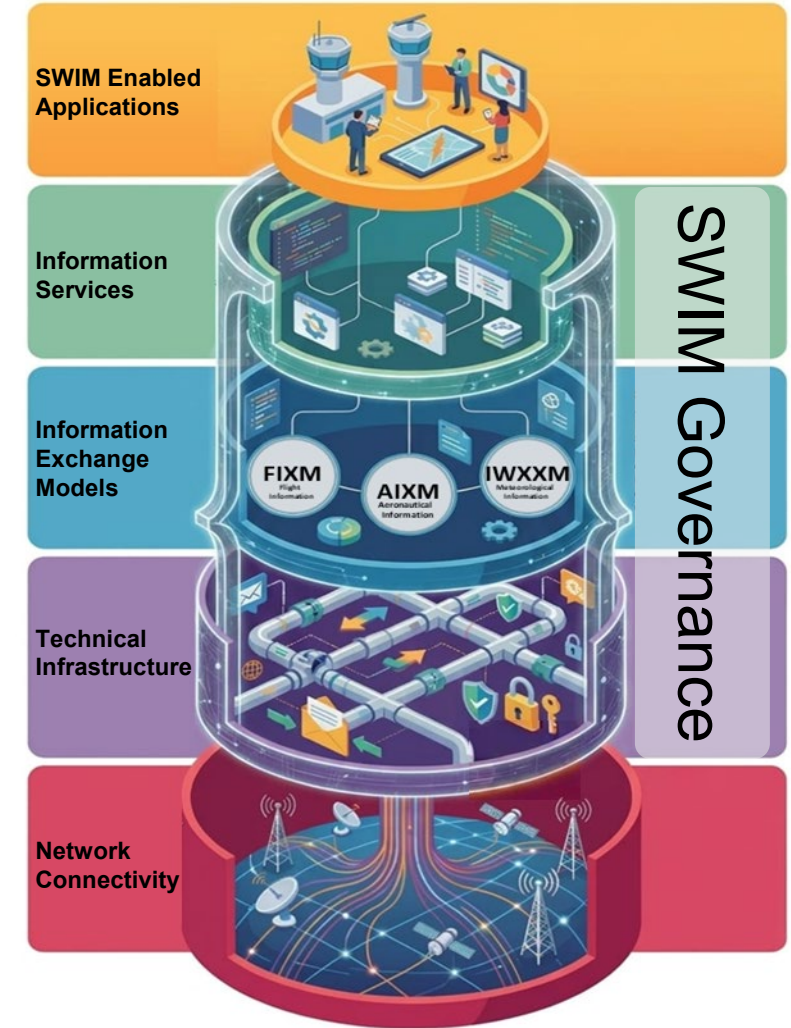
Establishes syntax and semantics using standards like FIXM, AIXM, IWXXM, and other information exchange standards

### Technical Infrastructure

Provides core services including interface, security, and enterprise service management

### Network Connectivity

Provides telecommunications services, including hardware via private/public IP networks



# FAA's Evolutionary Implementation



**Service Oriented  
Architecture Foundation**



**Enterprise Messaging**



**Operational Maturity**

SWIM Governance as Prescribed by ICAO GANP, Doc 10039 (SWIM Concept),  
Doc 10203 (SWIM Implementation Manual), PANS-IM (Doc 10199), etc.

# Service Oriented Architecture Foundation

## Primary Focus:

- Deploying standardized governance, security, and policies to the initial SWIM Implementing Programs

## Core Data Delivered:

- Airport operational status, weather information, flight data, status of special use airspace, and airspace restrictions

## Key Implementations:

- SWIM Terminal Data Distribution System (STDDS) and SWIM Flight Data Publication Service (SFDPS) making local terminal and flight data widely available across en-route and traffic management domains



# Enterprise Messaging

## Primary Focus:

- Introducing the NAS Enterprise Messaging Service (NEMS), which acts as a universal middleman that enables customized, automated message routing with minimal hardware and software overhead for subscribers

## Core Capabilities Delivered:

- Integrated the NAS Common Reference (NCR) to correlate complex spatial and temporal aviation data to identify constraints that apply to, or may impact, a user's trajectory

## Key Implementations:

- Introduced strict adherence to global, standardized exchange formats (FIXM, AIXM, IWXXM)



# Operational Maturity

## Primary Focus:

- Formalize governance, validate interoperability, onramp additional Information Services, expand SWIM utilization

## Core Capabilities Delivered:

- SWIM Industry-FAA Team (SWIFT) established, SWIM Cloud Distribution Services (SCDS) deployed, additional SWIM services operational

## Key Implementations:

- Identity and Access Management (IAM) to reduce vulnerabilities by validating digital certificates, publicly accessible cloud-based infrastructure to provides near real-time SWIM data to the public and minimize demand on NAS Enterprise Secure Gateway (NESG)



# Current Status: Technical Infrastructure

## NAS Enterprise Messaging Service (NEMS)

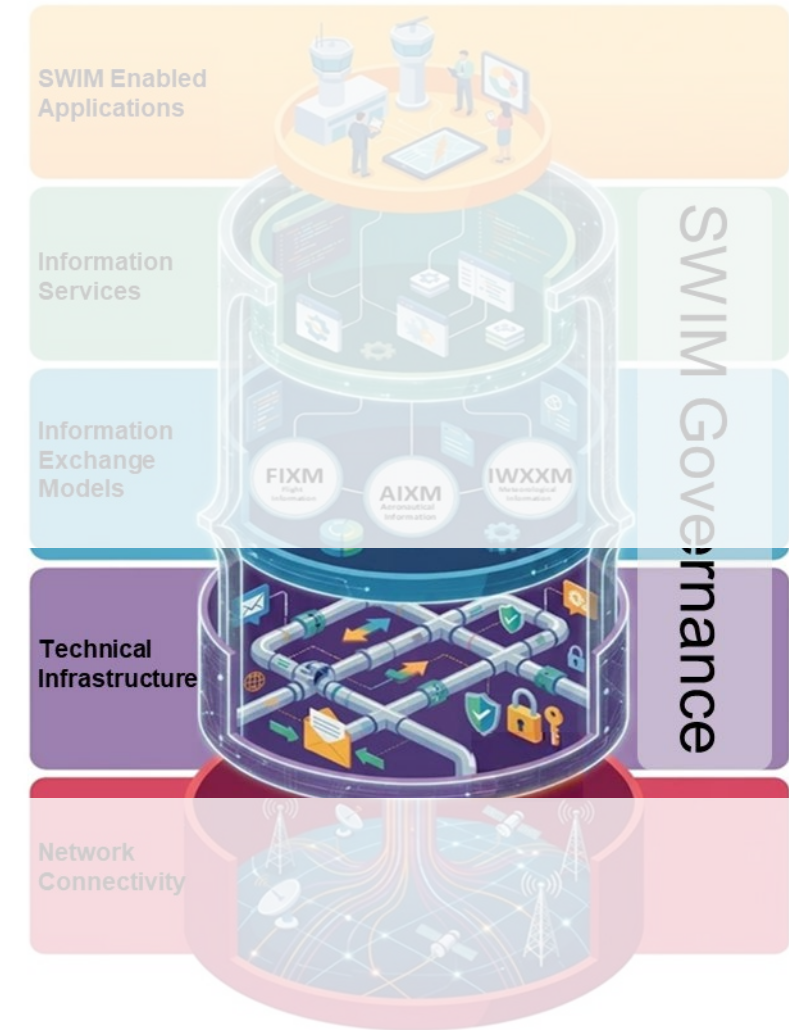
- Allows the seamless exchange of data between internal FAA Service Producers and Consumers

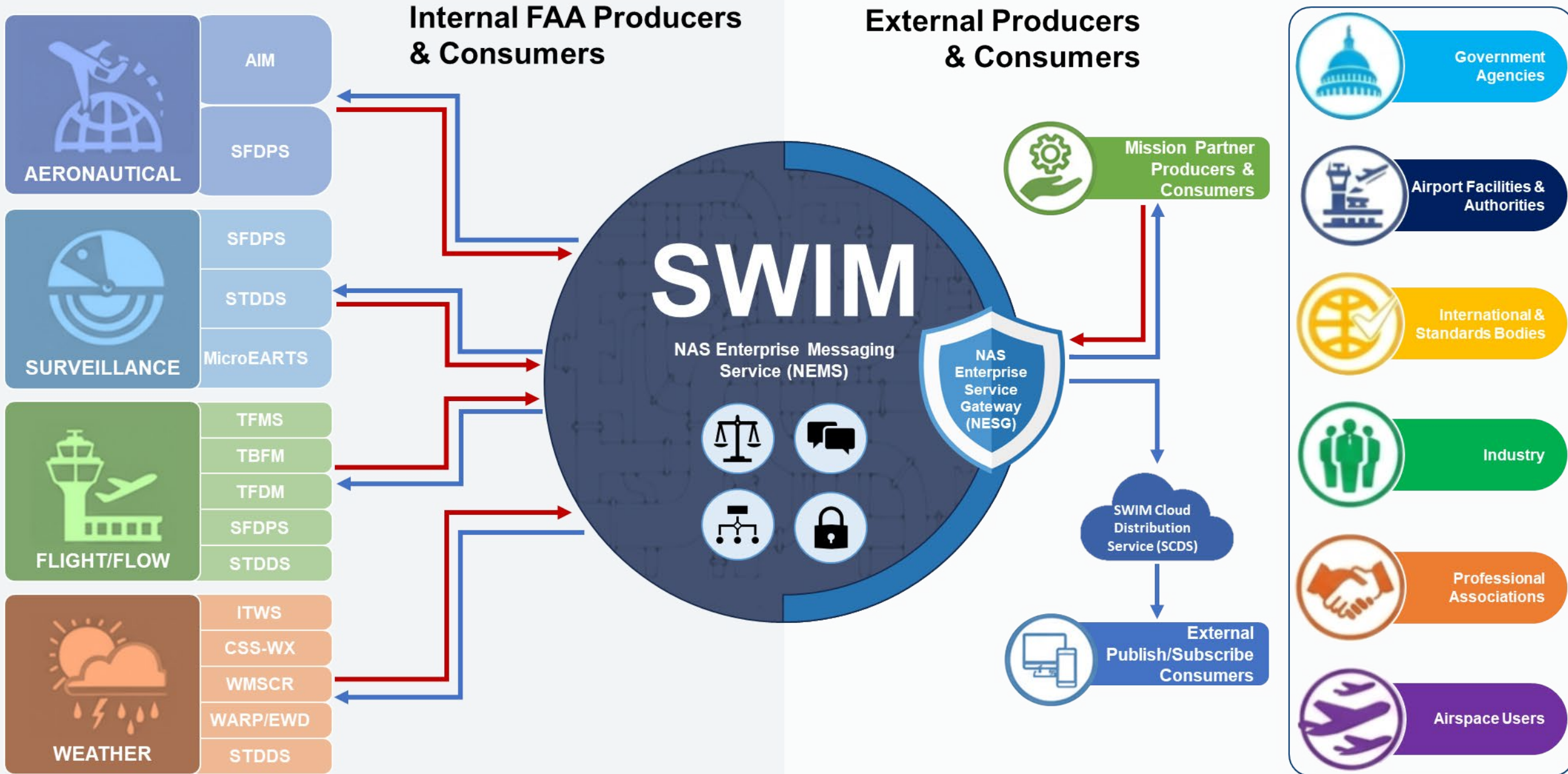
## NAS Enterprise Service Gateway (NESG)

- Serves as the highly secure, initial digital gateway designed to connect approved external Service Producers and Consumers (e.g. airlines, military, and vendors)

## SWIM Cloud Distribution Service (SCDS)

- Publicly accessible cloud-based infrastructure providing near real-time one-way SWIM data for public Service Consumers





# Current Status: Service Discovery & SWIM Registry

## NAS Service Registry and Repository (NSRR)

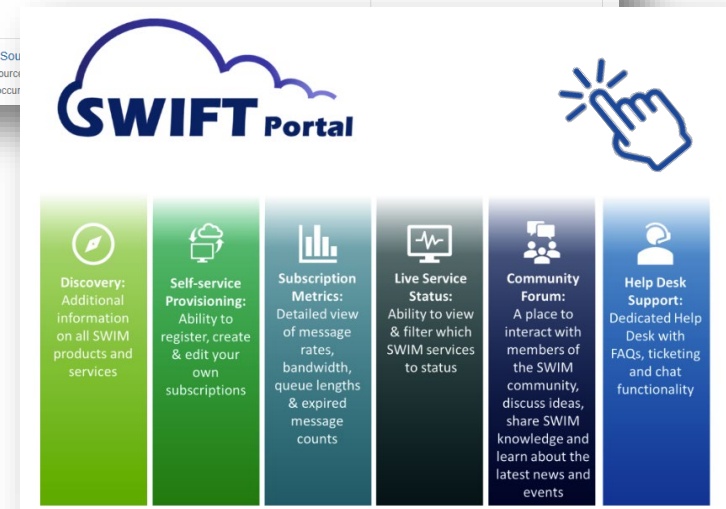
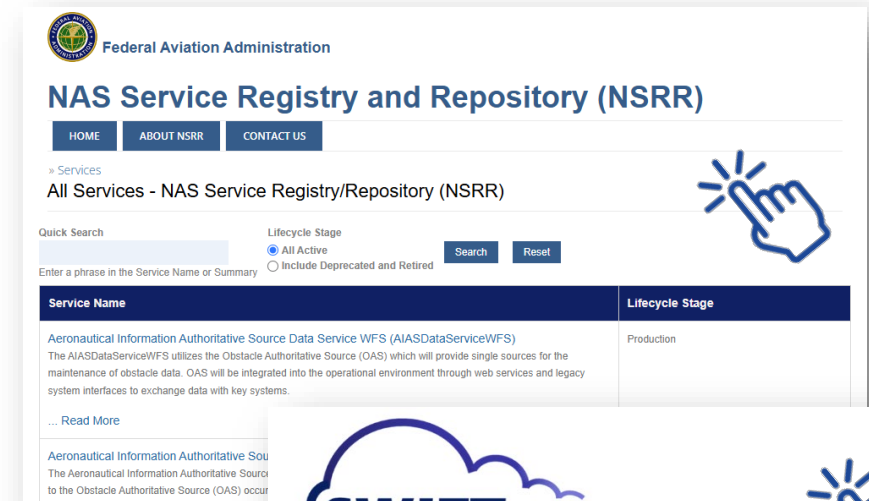
- Formal catalog for storing, managing, and cataloging all SWIM services metadata and artifacts
- Tracks services through their entire lifecycle from the "Proposed" stage to "Retired" stage
- Houses comprehensive documentation

## The SWIM Industry-FAA Team (SWIFT) Portal

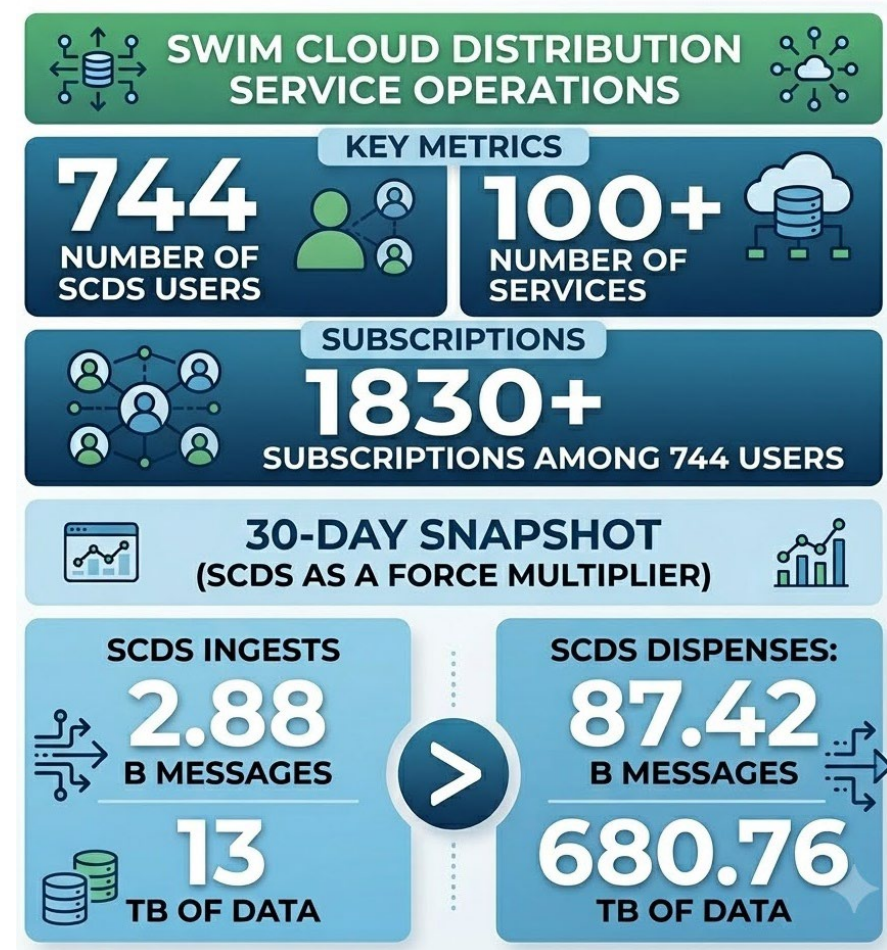
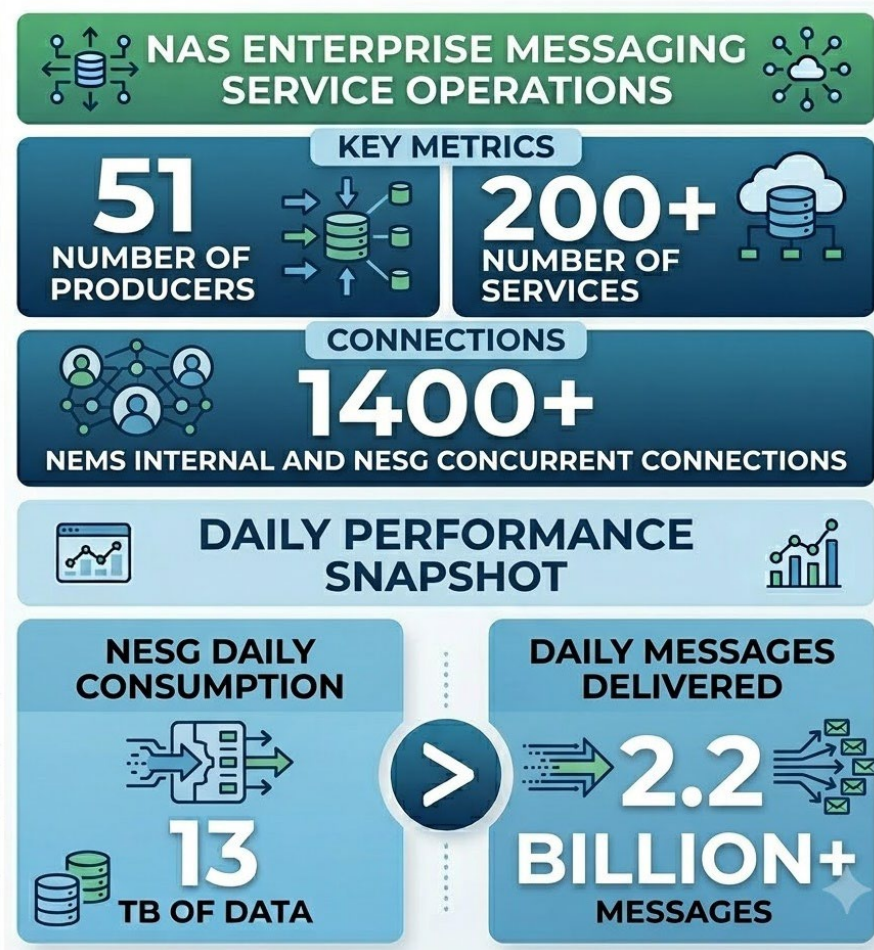
- Public and Developer Portal allowing users to browse available SCDS services
- Provides service status, community forums, and access to a self-service help desk

## SWIM Discovery Service (SDS) *[Under Development]*

- A standards-based web service that enables federated discovery of SWIM services across independently managed service registries
- Allows users to discover cross-registry services without requiring centralized metadata storage



# SWIM Services by the Numbers



# Example Use Case: Delay Mitigation & Metering Fix Predictability

## The Operational Problem:

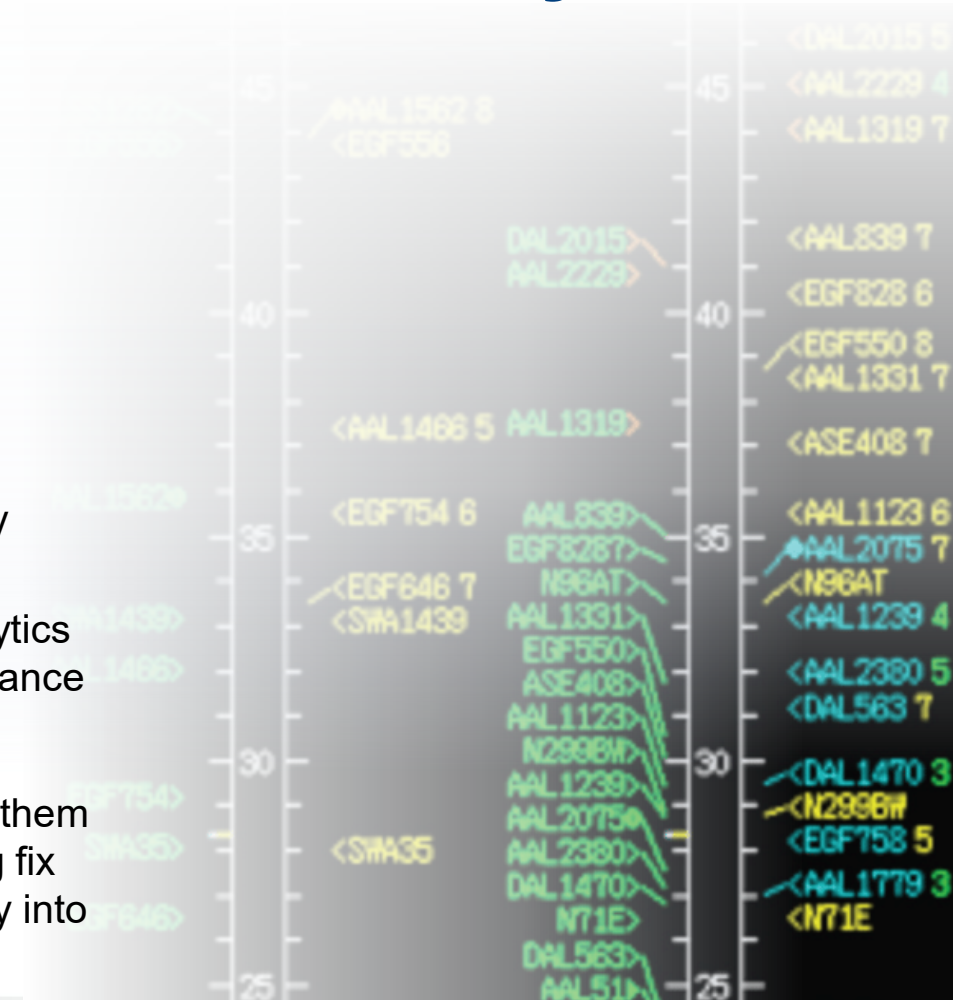
- Time-Based Flow Management (TBFM), the FAA's Arrival and Departure Management (AMAN/DMAN) tool, is used to meter and sequence aircraft through constrained airspace waypoints and terminal sectors
- Historically, airlines didn't have immediate visibility into precisely when an aircraft was being metered or delayed at a specific fix until it was already happening, leading to reactive and inefficient flight planning

## The SWIM Solution:

- A major U.S. Operator pioneered an effort to ingest raw TBFM data directly through SWIM
- By marrying this data with internal route tracking, they built predictive analytics models to identify bottlenecked departure gates and route fixes well in advance

## The Outcome:

- Dispatchers can proactively spot AMAN/DMAN constraint trends, allowing them to adjust departure times or coordinate reroutes around a choked metering fix before the aircraft leaves the gate, turning a reactive air traffic control delay into a managed business decision



# Ongoing Modernization: *In Progress*



Modular **bi-directional** cloud-native **architecture**



**Flexibility** with hybrid deployments, and messaging protocols



**Transition from site-specific legacy hardware** dependencies and tech refreshes to adoption



**Accelerated onboarding, self-service** portals, **Automation testing**, elevated user experience



Introduction of enterprise **API Gateway and API Management** solution for data exchange



**Automation tool suite** for monitoring, standardization, security, troubleshooting and governance

# International Collaborations



# Key Takeaways

- Internal Operational and System Management Efficiencies
- External Service Consumer Operational Benefits
- Sustained Stakeholder Engagement
- Ongoing Evolution to Keep Pace with Technology Developments and Operational Needs



# Links/Resources

## Program Overview

- [https://www.faa.gov/air\\_traffic/technology/swim/overview](https://www.faa.gov/air_traffic/technology/swim/overview)

## SWIM Access

- [https://www.faa.gov/air\\_traffic/technology/swim/products/get\\_connected](https://www.faa.gov/air_traffic/technology/swim/products/get_connected)

## Governance

- [https://www.faa.gov/air\\_traffic/technology/swim/governance](https://www.faa.gov/air_traffic/technology/swim/governance)

## Outreach/SWIFT

- [https://www.faa.gov/air\\_traffic/technology/swim/swift](https://www.faa.gov/air_traffic/technology/swim/swift)

