SWIM Cloud Distribution Service

Presented to: ATIEC Participants

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WHAT IS SWIM?

System Wide Information Management (SWIM) is the information-sharing platform that allows members of the aviation community to access the specific information they need, in the way they need it, to facilitate an innovative and efficiently run National Airspace System (NAS).

What does SWIM provide for the Aviation community?

- SWIM offers a single point of access for real-time, relevant, and reliable aeronautical, flight, and weather information so users can respond faster and more accurately.
- SWIM provides the standards and policies to achieve interoperability across aviation systems.

SWIM is a NextGen transformational program

SWIM is the Digital Data-Sharing Backbone of NextGen

INFORMATION ACCESS to transform the aviation community
How much data gets passed through SWIM?

<table>
<thead>
<tr>
<th>messages per day</th>
<th>messages per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6 Trillion</td>
<td>568 Trillion</td>
</tr>
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</table>

Estimated 4.3 TB Data per Day
SWIM BENEFITS

- Creates collaboration opportunities across borders.
- Helps to reduce costs & increase agility, do more with less.
- Drives innovation to create new and cutting edge tools and applications.
- Facilitates an innovative and efficiently run airspace.

- Increases efficiency with which FAA shares data and users obtain data.
- Supports development and adoption of a global aviation language.
- Provides enterprise-level capabilities.

Aviation Information World - Forecasting the Future
What was life like before SWIM?

In the past, the state of the art for connecting two systems required a fixed network connection and custom, point-to-point, application-level data interfaces. Current National Airspace System (NAS) operations depend upon these legacy information systems with some systems entirely unconnected.
SWIM is Built on Engineering Principles and Infrastructure

NextGen Applications: ADSB, AIM, DataComm, NVS, TFDM, PBN etc.

Standards for Data Exchange: Data Standards & Harmonization

SWIM Messaging Infrastructure: SWIM Core Services

FTI IP Backbone: FTI Operational IP network provides secure transport

Standards for Data Exchange:
- AIXM
- FIXM
- WXXM

FTI IP Backbone:

SWIM Messaging Infrastructure:

NextGen Applications:
- Controllers
- System Developers
- Terminal Controllers
- FAA Command Center
- Non-FAA Users (e.g., Airlines, DoD, DHS, ANSPs)

FTI Operational IP network provides secure transport

Aviation Information World - Forecasting the Future
SWIM Services by Phases of Flight

**Departure**
- Pre-Departure Flight-Planning
- Current and forecast weather information
- NOTAMS
- Flight Restrictions
- Flow Information
- Trajectory Planning
- Real-time surface movement

**En-Route**
- Flight re-route information
- Current and forecast weather information
- Updates to NOTAMS
- Flight restrictions changes
- Flow information changes

**Arrival**
- Arrival metering information
- Real-time surface movement
- Airport surface movement
- Current weather information

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**System Wide Information Management**

STDDS  FNS  SF DPS  ITWS  WM SCR  
TB FM  TFMS  SF DPS  FNS  
STDDS  SF DPS  IT WS

Aviation Information World - Forecasting the Future
SWIM Data Sets

Weather Data

• **Integrated Terminal Weather Service (ITWS):** Provides specialized weather products in the terminal area.
• **SWIM Terminal Data Distribution System (STDDS):** Provides Runway Visual Range data (RVR) including visual runway range, trend information and runway edge lighting.
• **Common Support Services- Weather (CSS Wx):** the single provider of weather data, products, and imagery within the National Airspace System (NAS).
• **Weather Message Switching Center Replacement (WMSCR):** Provides National Weather Service (NWS) textual aviation weather products, altimeter data, and Pilot Reports (PIREPs).

Flight and Flow Data

• **Traffic Flow Management System (TFMS):** Provides flight data and flow information.
• **SWIM Terminal Data Distribution Systems (STDDS):** Collects and publishes flight data from 150+ airports and 100+ TRACONs; Provides Flight Plan, Tower Departure Clearance data, and DATIS data.
• **Time Based Flow Management (TBFM):** Provides Aircraft, Airport Configuration and Metering Status.
• **SWIM Flight Data Publication Service (SFDPS):** Provides flight plan and flight plan updates to clients for filed and active flight plans.
• **Terminal Flight Data Management (TFDM):** Decision Support Tools for Airport and Terminal Airspace.
SWIM Data Sets

Aeronautical Information

- **Aeronautical Information Management (AIM) Federal NOTAMS Distribution System**: Provides notification and status via digital Notices to Airmen (NOTAM)
- **AIM Special Activity Airspace status and updates**
- **AIM Modernization Segment Two**: Modernizes the ingestion, integration, management, maintenance, and distribution of AI by establishing the Aeronautical Common Services (ACS) and a one-stop-shop portal

Surveillance

- **SWIM Terminal Data Distribution System (STDDS)**: Collects and publishes track data from over 200 airports and 100 Terminal Radar Approach Control Facilities (TRACON) including terminal and surface tracks and surface movement events.
- **SWIM Flight Data Publication Service (SFDPS)**: Collects and publishes track data from 20 Air Route Traffic Control Centers (ARTCC) covering the lower 48 continental states.
Who is Using SWIM Today?

181 Total Internal and External Consumers

*Updated as of May 21, 2019

- Airlines (12)
- Industry (115)
- Airports, FAA Facilities, & FAA Programs (37)
- Academia & Research (2)
- Non FAA Government Entities (15)
Increase in External Customer Demand

Challenge: External Consumer Demand:
- 2013: Executive Order - Open Data Policy – 23 External Consumers
- 2016: FAA External Data Access initiative (EDAi)
- 2018: Currently 166 External consumers with 90 on-ramping activities in-progress
- Future producer programs will continue to draw in more interest

Impact:
- Growing number of external users straining gateway capacity
- 400+ consumer services, estimated at over 4.3 terabytes of data consumed per day

Solution:
- Move external non-aviation partners to a cloud solution

*2018 number as of August 2018
WHAT IS SCDS?

SCDS is a publicly accessible cloud-based infrastructure dedicated to providing near real-time SWIM data to the public via Solace JMS messaging. This service includes access to the same public data that is currently offered via the NAS Enterprise Service Gateway (NESG) SWIM implementation.

SCDS provides data users (a.k.a. consumers) with a simplified, quick method of accessing FAA SWIM data in comparison to the more complex process of connecting to the NESG.

All product(s) provided by SCDS have been pre-approved for public release by the National Data Release Board (NDRB) and are intended for non-National Airspace System (NAS), non-Operational use.
SWIM – SCDS Strategy: Driving Consumers to the Cloud

- Address increasing external demand, while reducing bandwidth/impact to NESG, NEMS, and TIC
- Limit NESG exposure to external users
- User “criticality” determines method of data access (NESG vs. SCDS)
- Improved user experience
- Lower cost for service delivery through automation
- Platform for growth in services
- Smooth transition for users
SCDS – Messaging Service

Sustained success of SWIM has led to continued growth of SWIM community

- Cloud Based Infrastructure
- Service Management
- User Self Service
- Service Status
- Messaging Service

- Help Desk Support
- Security Controls
- SWIM Governance
- Future Service Enhancements and Growth

SCDS Access

SCDS accesses SWIM/NEMS through NESG and TIC

[Requires modified FCS DMZ Data Flows]
SCDS Experience

Self-service Provisioning: Ability to create connections in real time

Managed Failover: Redundant connections and cloud technology, to create a reliable environment

Service Management: Fine-grained filtering ability

Subscription Level Metrics: Detailed view of message rates, bandwidth and other metrics

Security Controls: Utilizes TLS connection technology

Help Desk Support: Dedicated Help Desk
SCDS On-Boarding Process

1. Complete Access Agreement(s)
   - Create an account: https://data.faa.gov
   - Complete Access Agreements for the SWIM JMS services to be consumed via SCDS

2. Create a User Account on SCDS
   - Create user account: https://scds.swim.faa.gov
   - Please use the same email address registered to your Access Agreement account: https://data.faa.gov

3. Create SCDS Subscription Requests
   - Create SCDS Subscription Requests to include any desired data filters
   - Ensure Access Agreements have been completed for the SWIM service requested in the Subscription (otherwise the subscription will be denied)

4. Consume SWIM Data
   - Subscription requests are reviewed, approval will be provided within 72 hours of request, and then provisioned automatically
   - Connect your consumer application to your approved SCDS subscription(s) and consume SWIM data
## Consumer Services: NESG vs SCDS

<table>
<thead>
<tr>
<th>CONSUMER SERVICES</th>
<th>NESG</th>
<th>SCDS</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Request</td>
<td>✓</td>
<td>✓</td>
<td>SCD expedites data request process</td>
</tr>
<tr>
<td>Data Access Approval</td>
<td>✓</td>
<td>✓</td>
<td>SCD expedites data release process</td>
</tr>
<tr>
<td>Self Provisioning</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>No Service Acceptance Tests Required (L3, SA, etc.)</td>
<td></td>
<td>✓</td>
<td>SCD does not require SAT</td>
</tr>
<tr>
<td>Sensitive Data Availability</td>
<td>✓</td>
<td></td>
<td>Sensitive data will not be shared via SCDS</td>
</tr>
<tr>
<td>Help Desk Resolution</td>
<td>✓</td>
<td>✓</td>
<td>Enterprise Control Center (ECC) provides 24/7/365 resolution</td>
</tr>
<tr>
<td>Web Services</td>
<td>✓</td>
<td></td>
<td>SCD does not currently support web services</td>
</tr>
<tr>
<td>Sample Data Availability</td>
<td>✓</td>
<td>✓</td>
<td>NESG request is manual, SCDS is automated</td>
</tr>
<tr>
<td>Jumpstart Kit Availability</td>
<td>✓</td>
<td>✓</td>
<td>NESG available on request, SCD is self-service</td>
</tr>
<tr>
<td>Data Metrics / Statistics</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>SWIM Service Status (self-service)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Client Data Compression</td>
<td>✓</td>
<td></td>
<td>Compression out of SCD is not available at this time</td>
</tr>
<tr>
<td>Client Data Encryption (required)</td>
<td>VPN</td>
<td>SSL/TLS</td>
<td></td>
</tr>
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</table>
SCDS Website
scds.swim.faa.gov

SWIM Cloud Distribution Service

Subscribe to SWIM data products and monitor your data feeds in real-time

GET STARTED
Available SCDS Documentation

• Refer to the SCDS Support page for additional information
  – FAQs
    • General
    • Data
    • Technical
    • Accessing SCDS
  – User Guide
    • Includes on-boarding process
# SCDS Dashboard

## Users
- **57** Users
- **20** Pending Subscriptions
- **12** Connected Users
- **128** Approved Subscriptions

## System (last 24 hours)
- **99.04M** Ingress Messages
- **275.41M** Egress Messages
- **353.93GB** Ingress Data
- **1.76TB** Egress Data

## Products
<table>
<thead>
<tr>
<th>Product</th>
<th>Status</th>
<th>Ingress (msg/sec)</th>
<th>Pending</th>
<th>Approved</th>
<th>Connected</th>
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<tr>
<td>STDDS</td>
<td>up</td>
<td>679.44</td>
<td>5</td>
<td>33</td>
<td>12</td>
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<tr>
<td>ITWS</td>
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<td>TFMS</td>
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<td>TBFM</td>
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<td>3</td>
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<td>FDPs</td>
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<td>1</td>
<td>25</td>
<td>8</td>
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<tr>
<td>AIM FNS</td>
<td>up</td>
<td>0.26</td>
<td>2</td>
<td>19</td>
<td>7</td>
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SWIM Industry FAA Team (SWIFT)

Purpose:
- SWIM Industry FAA Team (SWIFT) is a joint government/industry initiative chartered to improving information exchange among aviation community stakeholders, using SWIM services

FAA/Government: FAA Co-Chair leadership
- Enable access to FAA information, delivered as business services, in forms appropriate for use by NAS stakeholders
- Provides information services that promote common situational awareness among participating stakeholders
- Distribute processed data to all government agencies and industry

• Industry partners: Industry Co-Chair leadership
- NAS stakeholders benefiting from NAS information sharing
- Participants having subject matter expertise in airline, airport or FAA operations, processes, procedures and related systems
- Members evaluated based on benefit provided to NAS, as a whole
Questions?